# RESEARCH REPORT

## Effect of Household Socioeconomic Status on Household Dynamics in a High HIV Prevalence Area of the KwaZulu-Natal Province from 2003 – 2012

**PATRICIA GWELIWO**

**STUDENT NUMBER: 706782**

**Supervisors:**

Associate Professor Tobias Chirwa

Dr Makandwe Nyirenda

School of Public Health, Faculty of Health Sciences

University of the Witwatersrand, Johannesburg, October, 2016

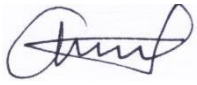
A research report submitted to the Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the degree of Master of Science in the Field of Population-Based Field Epidemiology

## DECLARATION

I, Patricia Gweliwo, (Student number: 706782) declare this report is a result of my own work. Acknowledgement by way of referencing has been used in sections where ideas of others were used.

This is a submission for the partial fulfilment of a Master of Science degree in Epidemiology in the field of Population-Based Field Epidemiology at the School of Public Health, University of the Witwatersrand (Wits). This has not been submitted anywhere else before.

Name: Patricia Gweliwo

Signature: 

Date: 7th October, 2016

## DEDICATION

I dedicate this piece of work to my parents, Mr. and Mrs Francis Gweliwo ; my siblings, Lora and Veneranda Gweliwo Also to my husband Dr. Patrick Opoku Asuming and my son, Nana Kofi Opoku Assuming. You are all my inspiration.

## ACKNOWLEDGEMENT

I am very grateful to the Almighty God for making this MSc programme a successful one. I am most importantly thankful to my sponsors, INDEPTH-Network for funding me for the MSc Population-Based Field Epidemiology Programme, a programme that has greatly enriched my knowledge in health research.

I also acknowledge the Navrongo Health Research Centre, the humble beginnings of my research career started here.

I am grateful to the staff of the Africa Centre for Health and Population Studies for the warm hospitality during my field attachment. I especially thank Dr. Kobus Herbst and Ant Snyman for the data assistance they provided for my research. I also extend my sincere gratitude to the individuals in the Hlabisa community who provided valuable information for the purpose of this research.

My sincere gratitude to my supervisors, Dr. Makandwe Nyirenda and Associate Professor Tobias Chirwa for the mentorship during the period of my research work, and all lecturers of the School of Public Health for taking time to impart knowledge into me. Cheers, respectively to my Academic Course and Research Coordinators Mrs Angeline Zwane and Mrs. Busi Ngoyi, for all the administrative support during my studies at Wits.

# TABLE OF CONTENTS

Declaration ..... II

Dedication ..... III

Acknowledgement ..... IV

List of Figures ..... VIII

List of Tables ..... IX

ABSTRACT ..... X

List of Abbreviations ..... XIV

Definition of Key terms ..... XV

1 CHAPTER ONE - INTRODUCTION ..... 1

1.1 Introduction ..... 1
1.2 Background of study ..... 1
1.3 Problem statement ..... 3
1.4 Justification ..... 4
1.5 Objectives ..... 7
1.5.1 Main Objective ..... 7
1.5.2 Specific Objectives: ..... 7
1.6 Literature Review ..... 7
1.6.1 Changing Household types and size ..... 8
1.6.2 Household formation ..... 9
1.6.3 Household dissolution ..... 10
1.6.4 Migration ..... 11
1.6.5 Marriage ..... 12
1.7 Conceptual Frame work ..... 13
1.8 Hypotheses ..... 14
1.8.1 Hypothesis 1 ..... 14
1.8.2 Hypothesis 2 ..... 15

1.8.3 Hypothesis 3 ..... 15
1.9 Expected contribution ..... 15
2 CHAPTER TWO - METHODOLOGY ..... 16
2.1 Materials and methods ..... 16
2.2 Study Site ..... 16
2.2.1 Descriptive characteristics of the study sample ..... 17
2.3 Study Design ..... 19
2.4 Data collection and validation procedures ..... 20
2.5 Data entry and management ..... 20
2.6 Variable definitions ..... 21
2.7 Statistical analysis ..... 26
2.8 Ethical Considerations ..... 27
2.9 Study Limitations ..... 27
3 CHAPTER THREE - RESULTS ..... 29
3.1 Descriptive characteristics of household formation ..... 29
3.2 Descriptive characteristics of household ..... 35
3.3 Factors Associated with Household Formation ..... 44
3.4 Factors Associated with Household Dissolution ..... 47
3 CHAPTER FOUR - DISCUSSION ..... 51
3.1 Household Socio-Demographic Factors and Formation ..... 51
3.2 Household Socio-economic Factors and Formation ..... 53
3.3 Household Demographic Factors and Dissolution ..... 55
3.4 Household SES Factors and Dissolution ..... 57
3.5 Conclusions ..... 58
3.6 Recommendations ..... 59
4 REFERENCES ..... 61
5 APPENDICES ..... 66
5.1 Appendix I: Plagiarism Declaration ..... 66
5.2 Appendix II: Turnitin Plagiarism Report ..... 67
5.3 Appendix III: Africa Centre for Health and Population Studies Ethics certificate ..... 68

5.4 Appendix IV: University of the Witwatersrand Ethics Certificate.....69

## LIST OF FIGURES

Figure 1-1: Conceptual Frame work of Household Formation and Dissolution ..... 14

Figure 2-1: A Flow Diagram Showing Sample Inclusion and Exclusion Criteria ..... 18

Figure 3-1: Percentage of Newly Formed Households over Study Period..... 30

Figure 3-2: Household Dissolution Trends from 2003 – 2012..... 35

Figure 3-3: Wealth Index Transitions in Households over Study Period..... 36

## LIST OF TABLES

Table 2-1: The dynamics of households in the study area over the study period ..... 19

Table 2-2: Outcome variables ..... 22

Table 2-3: Socioeconomic (Exposure) variables ..... 23

Table 2-4: Other study covariates ..... 24

Table 3-1: Descriptive characteristics of newly formed and pre-existing households at start of household observation ..... 31

Table 3-2: SES Characteristics of newly formed and pre-existing households at start of study .. 33

Table 3-3: Household characteristics of undissolved and dissolved households at start and end of household observation ..... 40

Table 3-4: SES characteristics of dissolved and undissolved households ..... 43

Table 3-5*:* Univariate and multivariate results of factors associated with household formation . 46

Table 3-6: Univariate and multivariate results of factors associated with household dissolution 49

# ABSTRACT

## INTRODUCTION

Socio-economic status (SES) disparities do not only exist between racial groups in South Africa but also exists within the vulnerable black population with the devastating impacts of the HIV epidemic. Households are important determinants of human welfare. However, little is known about the effect of household socio-economic status on the establishment and break-up of households within a low-resource setting and a severe HIV epidemic. It is in the midst of these challenges in rural South Africa that this study examined the effect of household SES on household formation and dissolution among the black population in rural northern KwaZulu-Natal.

## METHODS

Using longitudinal data from the period 2003-2012 from the Africa Centre for Health and Population Studies, the study used a cross-sectional study design approach to examine the effect of household SES on household formation. It also examined the effect of household SES change (i.e. either positive, negative change or stable SES) between the start and end of observation of a household within the study period. Household formation was defined as when an individual or individuals come from different households to form a new social unit with a new household head. Dissolution occurred when all individuals in a household end their membership to a household due to death, out-migration or by joining other households. Separate regression models for the two outcomes, household formation and dissolution were explored with household SES covariates while adjusting for other household variables.

## RESULTS

Household formation and dissolution trends both decreased over the study period. Out of a total of 18,249 households, newly formed households had a relatively higher percentage of tertiary educated household heads (10.7% versus 2.5%), unemployed household members (41.6% versus 28.5%), grant recipient household members (37.1% versus 8.5 %) and households within the average to richest wealth quintiles (44.1% versus 36.4 %) than pre-existing households. Multivariate analysis showed that tertiary educated household heads (aOR=2.96, 95% (CI) 2.26-3.89) and households within the average to richest wealth quintiles most especially the 4th quintile (aOR=3.29, 95% (CI) 2.69-4.04) were associated with a higher odds of households being newly formed. However, the lesser the employed members (aOR=0.31, 95% (CI) 0.21-0.45) and grant recipients per household size in a household (aOR=0.15, 95% (CI) 0.12-0.18) the lower the odds of formation. Furthermore, small size households (aOR=0.68, 95% (CI) 0.56-0.80) and unmarried household heads (aOR =0.47, 95% (CI) 0.40-0.55) were associated with lower odds of being newly formed. Whereas female headed households (aOR=2.23, 95% (CI) 1.93-2.57) were associated with a higher odds of household formation.

With regards to household dissolution, close to a quarter of households had an increase in SES over the study period compared to households with a decreased SES (24.6% versus 8.6 %). Similar to household formation, male headed households dominated the study population with the highest proportion in dissolved households (63.8% and 61.5% at start and end of household observation respectively). Also unmarried household heads were the majority in dissolved households (62.7% and 64.1% at start and end of household observation respectively). Approximately 65.6% of households that never dissolved had an extended family type of composition compared to 36.6% of dissolved households. The area was predominantly rural with about 47.2% households in rural segment of the study area. The study has shown that households

had lower odds of dissolving if there is a positive change (i.e. an increase) in household SES compared with households with an unchanged SES over the period. In exact terms, an increment in the number of employed household members over the study period was associated 49% lower odds of a household being a dissolved (aOR=0.51 95% (CI) 0.42-0.61). Also, an increment in the number of household grant recipients over the period of observation was associated with a 69% lower odds to result in the dissolution (aOR=0.31 95% (CI) 0.25-0.39). Households with an improved wealth index over the period of study were associated with 55% lower odds of dissolution (aOR =0.45, 95% (CI) 0.38-0.54). However, households with both male and female death (multiple sex) were more likely to dissolve. Similarly, peri-urban (aOR=0.71; 95% (CI) 0.58-0.86) households were more likely to dissolve compared to urban households. Surprisingly divorced, widowed and separated couples were not significantly associated with household dissolution.

**CONCLUSION**

SES is an important determinant of household existence and stability. This study has shown a complex relationship between household SES and household formation. Although education and improved household wealth index were more likely to result in household formation, an increase in the number of employed household members and household grant recipients did not necessary have an effect on household formation. Government cash transfers, education, employment of household members are valuable cushioning mechanisms necessary for household stability. There is need for government and non-governmental organisations to set up interventions to improve the socio-economic conditions of poor households prioritising rural and female headed

households. This is especially critical in a high HIV prevalence area where these interventions will also mitigate against the burden of the HIV epidemic on the population.

## LIST OF ABBREVIATIONS

| | |
|---|---|
| ACDIS | Africa Centre Demographic Information System |
| aOR | Adjusted Odd ratios |
| ART | Antiretroviral Treatment |
| CI | Confidence Interval |
| DHS | Demographic Health System |
| DSA | Demographic Surveillance Area |
| HDSS | Health Demographic Surveillance System |
| HIV | Human Immune Virus |
| KZN | KwaZulu-Natal |
| OR | Odds Ratio |
| SES | Socioeconomic Status |
| SQL | Structured Query Language |
| WHO | World Health Organization |

## DEFINITION OF KEY TERMS

**Household:** This study adopts the Africa Centre for Health and Population definition of a household as a group of individuals who identify themselves through a common household head. They may or may not live and eat together, care for one another and share resources through dependence and responsibility of household members provided the self-identify as belonging together. Similar definitions of a household are used by other demographic surveillance systems (DSS) such as the Agincourt DSS.

**Household dynamics**: Refers to changes households undergo over time with respect to, inter alia, size, composition, structure and characteristics of household members. This study focuses particularly on household formation and dissolution.

**Household Formation:** Household formation is defined as an individual or individuals coming from different households either within the surveillance or via in-migration of individuals from different households outside the surveillance area to form a new social unit with a new household head. The movement of an entire household as a whole into the surveillance area is not classified as household formation.

**Household dissolution**: The concept of household dissolution is defined when all individuals in a household end their membership to a household due to death, out-migration or by joining other households. It should be noted that, the migration of an entire household to outside or within the study area will not be regarded as dissolution because these households will still remain as a social unit outside/within the surveillance area.

**Household composition** refers to characteristics of individuals making up a household with regards to the total number of its members, number of resident and non- resident members, socio-economic status of household members, age and sex distributions, among other factors.

**Migration** generally refers to the change in geographical location of the dwelling place of an individual or an entire household.

**Immigration** refers to when individuals/households move into the study area to join an existing household or to start a new one within the surveillance area.

**Outmigration** is the opposite of the above, that is, when individuals/households who previously resided within the surveillance area move to settle outside the surveillance area.

# 1 CHAPTER ONE - INTRODUCTION

## 1.1 Introduction

This chapter gives a background and contextualisation of the study. It involves a general background and problem statement and proceeds with a justification of the study and review of relevant literature on socio-economic status (SES) and study outcomes (household formation and dissolution) as well as determinants of these outcomes. This chapter also states objectives and study hypotheses. It concludes with a conceptual frame developed to contextualise the study and serve as a guide in analysis and statement of the hypothesis.

## 1.2 Background of study

South Africa is posed with several challenges of which two are of most global concern. Firstly, it is among the countries with the widest socio-economic disparities with the black population being the most deprived (May and Govender 1998; Klasen and Woolard 2009; Coovadia et al. 2009). However even within the black population, socioeconomic status (SES) disparities still exist as access to basic household amenities such as electricity, piped water supply adequate toilet facilities and employment is a problem in the rural population. Rural black populations tend to be more deprived than their urban counterparts (Tanser et al. 2008; Statistics South Africa 2013). Secondly, South Africa has high HIV prevalence rates. About 6.1 million South Africans in all age groups were estimated to be living with HIV while 17.9% of the reproductive age category (15-49 years) were infected in 2012 (UNAIDS 2013). These two challenges have contributed to economic drain to households (Richter and Desmond 2008) and the dissolution of some households (Hosegood et al. 2004) within the black population.

Besides, household structure and composition has been the main focus of many researchers (Edmonds, Mammen, and Miller 2001; Madhavan and Schatz 2007; Ziehl 2001), while neglecting household formation and dissolution, which are equally important factors associated

with the health and wellbeing of individuals. In cases where these studies have looked at household formation and dissolution, they are most often limited to marriage, cost of housing and women's earnings and most especially from western settings (Tamborini, Iams, and Reznik 2012; Schneider 2013) and other related factors such as, a single socioeconomic status measure (e.g. wealth index or unemployment) and adult deaths and migration in Africa (Klasen and Woolard 2009; Sartorius et al. 2014; Urassa et al. 2001; Hosegood et al. 2004).

Additionally, the paucity of studies on household formation and dissolution can be attributed to limited longitudinal household and SES data. A few of the studies that have attempted to describe household dissolution and SES fail to account for changing SES during the study period (Hosegood et al. 2004; Ziehl 2001). Also, much research in this area has been based on specific SES measurements such as employment (Klasen and Woolard 2009) while ignoring other important SES variables such as grants (Conger, Conger, and Martin 2010). SES is a broad measure and constitutes both social and economic status such as education, income and employment status of individual members or by a collective general household measure like household assets index. Although these different measures of SES may be interrelated, it is imperative to observe different SES measures as they are distinct measures and are capable of exerting different relationships on study outcomes (Wojcicki 2005). A limited exploration of these different SES variables could obscure the existence of a causal relation or limit scientific knowledge in regards to using specific SES variables.

This study aims at exploring the role of SES at household level on household formation and household dissolution in a high HIV prevalence rural South African setting. This will help identify households that are vulnerable to dissolution and factors associated with the formation of new households. This is important for the formulation of health, economic and population

policies. This study is particularly important in the setting of a vulnerable rural black KwaZulu-Natal population where poverty could be aggravated by the high HIV prevalence as well as migratory rates. Household formation and dissolution will be described over the study period 2003-2012.

## 1.3 Problem statement

Sociologists such as Rousseau elaborated on the social contract theory (Rousseau, Dunn, and May 2002). Though driven from a moral and political perspective, it can be applied to households. It draws its basis on the fact that, individualism was unable to sustain primitive man as the existence of isolated individuals at a point in nature arrived in crisis. There was the need for the human race to form aggregates for a common good. The theory involves the forming of social groups by individuals for their common good (Rousseau, Dunn, and May 2002). These groupings are important determinants of human welfare and are transformed into the families, societies and nations however; important drivers for household formation and stability such as marriage are declining in recent times.

Also, there is empirical evidence on the important role SES plays with regards to the functioning of human aggregation. Favourable SES will sustain families from breakup and the vice versa (Conger, Conger, and Martin 2010), as Hosegood (2004) states that "financial security is a long-term predictor of a viable household".

In spite of this, many black South African households are faced with the challenges of HIV and poverty. This has resulted in large socioeconomic disparities in South Africa and among the black African population. Overall unemployment rates as at the fourth quarter of 2013, stood at 24.1%; about 27.1% among black Africans compared to 7.2% among Whites (Statistics South Africa 2014a). Unsurprisingly therefore, black South Africans are associated with generally low SES comparative to other races in South Africa. The low SES levels among black South Africans

along with the devastating impact of the HIV epidemic poses tremendous challenges for how they form new households and sustain existing ones. This is because sexual relationships and mother to child transmissions among others are the most common modes of HIV transmission in South Africa. This implies the likelihood of HIV clustering in specific households and consequently resulting in poverty, death of individuals, and consequently, household dissolution and low household formation rates.

The dearth of empirical work on household SES effect on formation and dissolution in a high HIV prevalent KZN area has been attributed to limited availability of longitudinal data on detailed household formation and dissolution rates, socioeconomic status measures over time, challenges with regards to cost and the low response of individuals to SES and HIV surveillance (Welz et al. 2007). It has therefore not been possible to link household socioeconomic status to household dynamics (household formation and dissolution) in a rural high HIV prevalent black population.

In this study, we shall determine the role of four different forms of household SES on household formation and dissolution using longitudinal data over a 10 year period, 2003 -2012. The study will further determine the relationship between household SES and household formation and dissolution in rural northern KwaZulu-Natal which has received less attention in research literature.

## 1.4 Justification

The justification for this study comes from the importance of household dynamics for public health and policy together with the limited empirical studies on the association of SES factors with household dynamics using longitudinal studies. Studies on formation and dissolution have usually focused on marriage (Tamborini, Iams, and Reznik 2012; Schneider 2013; Fafchamps and Quisumbing 2007), while some household formation studies tend to focus on economic

barriers to accessing housing (Ermisch and Di Salvo 1997). Also majority of these studies have been conducted in the Western world raising issues about generalizability to African setting. In South Africa, household SES studies have mainly focused on structure and composition such as types and individual make up of households (Edmonds, Mammen, and Miller 2001; Madhavan and Schatz 2007; Wittenberg and Collinson 2007a), while others have been limited to mortality, migration, and unemployment (Gregson, Mushati, and Nyamukapa 2007; Hosegood et al. 2004; Klasen and Woolard 2009; Urassa et al. 2001).

Negative health outcomes are partly a consequence of the physical environment particularly with regards to infectious diseases and parasitic infections. The inability of individuals especially the younger ones to split and form new households may be a predisposing factor for TB and other infectious disease transmission in larger households.

A major limitation in the available literature has been a lack of an appropriate definition of households. Particularly studies that make use of Demographic and Health Survey data (DHS), tend to generally define a household as a group of individuals who live together and eat from the same pot (Ayad 1994). Statistics South Africa uses a similar definition of describing a household as an individual or group of individuals who stay together and share common resources for a living (Statistics South Africa 2012a). Such definitions are inadequate because they fail to account for the fluid and complex nature of living arrangements particularly in rural South Africa where respondents will usually include non-resident and dual household memberships. But even some surveillance systems such as the Karonga and Kisesa DSSs do base household definition on co-residency status (Jahn et al. 2007; Urassa et al. 2001). The Africa Centre for Health and Population Studies allows for complex living arrangements, multiple household membership and non-resident memberships. In the Africa Centre system a household is defined as a social unit of

individual(s) who self-identify themselves as such through one household head (Hosegood, Benzler, and Solarsh 2005; Wittenberg and Collinson 2007a). Such a definition implies a household may be a social unit of individuals who may or may not be related by blood; may or may not share a common space, thus may be resident and/or non-resident members; and may or may not share joint household resources through dependence and responsibility towards other household members. The use of a household definition which does not account for the complex nature of South Africa households especially inter- household resource sharing could distort the study results.

This study will provide updates on household formation prevalence in recent times there by, providing valuable information for policy intervention and evaluate existing government interventions This study will also help determine annual prevalence of household formation and dissolution over the period in the study area. The study will not only identify household level SES factors but also other characteristics associated with the formation and dissolution of households. This will aid in prior and timely identification of households liable to dissolution most especially in a high HIV setting for timely intervention. The findings of this study will help governments in Africa, especially Southern African countries who share similar characteristics to the study setting with scientific evidence on the role of socioeconomic status on household dynamics and the overall implications on health and human welfare to formulate appropriate health, social and economic policies. This will, in turn, help to protect vulnerable individuals and households that may face negative consequences with regards to household formation and dissolution.

## 1.5 Objectives

### 1.5.1 Main Objective

The main objective of this study is to investigate the effect of household socioeconomic status on household formation and dissolution in a high HIV prevalence rural KwaZulu-Natal black population from 2003 – 2012.

### 1.5.2 Specific Objectives:

The specific objectives of this study will be:

- To describe the distribution of household formation and dissolution by study years over the study period in rural KwaZulu-Natal.
- To examine factors associated with household formation and dissolution from 2003 – 2012 in rural KwaZulu-Natal.

## 1.6 Literature Review

According to the Africa Centre household definition, household members are usually related by blood ties or by other forms of formal relationships but need not always be related (Tanser et al. 2008; Hosegood, Benzler, and Solarsh 2006). This implies that, members can be classified as resident or non-resident members. The household can only reside at a particular location at any point in time. The Agincourt HDSS employs a similar concept of a household (Kahn et al. 2007). It uses the resident and non-resident concept of classification of household members. Others such as the Statistics South Africa and DHS are based on the co-resident concept and emphasize relatedness (Statistics South Africa 2012a). These organisations define a household as an individual or group of people who live together and eat from the same pot (Ayad 1994; Statistics South Africa 2012a). This definition fails to account for complex living arrangements and migratory networks typical in South African settings.

The main advantage of using the Africa Centre definition of household definition is that, it accounts for the dynamic and complex living arrangements by including non-resident household

members and multiple household memberships, which is typical of rural South Africa households (Hosegood and Timæus 2005). Though household members may be non-resident, they are regarded as household members in relation to their involvement in sending remittances to households or dependability on households for support and their participation in household decisions (Hosegood, Benzler, and Solarsh 2006).

### 1.6.1 Changing Household types and size

Research around the area of household patterns in South Africa has produced mixed findings. Beittel (1992) predicts a future raise in multigenerational households. On the contrary, Amoateng, (1997) found that black households have shifted from the traditional extended family prospective to nuclear and single member households. The rise in nuclear family patterns has been attributed to urbanisation (Ziehl 2001) and the splitting of large households by individuals household members resulting in the decreasing household sizes in recent times (Van Zyl, Cross, and Donovan 2008; Madhavan and Schatz 2007; Wittenberg and Collinson 2007b). Others (Chandler et al. 2004; Wittenberg and Collinson 2007a) on the contrary found no evidence of increase in single or nuclear member households in South Africa especially with regard to surveillance data. This consolidates the finding of Beittel (1992) in the early 1990's, an increase in multigenerational households as a result of HIV mortality and social pressures.

Some studies found an increase in female headed households (Madhavan and Schatz 2007; Beittel, Smith, and Wallerstein 1992). However there was no increase in fragile households such as child headed and skipped generational households (Wittenberg and Collinson 2007a). The different types of multimember households that exits in South Africa include couple only households, nuclear households (made up of couples and children), single parent households, multigenerational households and households with unrelated members (Wittenberg and Collinson 2007a; Ziehl 2001).

The contradicting findings in these studies could be a result of the study design, setting and methodology used. For example (Chandler et al. 2004) study was conducted in the West (England and Wales) while others though conducted in different South Africa setting, had a different target population of both white and black individuals (Van Zyl, Cross, and Donovan 2008; Ziehl 2001) which raises concerns of generalizability to South African black population. Though Madhavan and Schatz (2007) mentioned of using a 10 year longitudinal study design, they virtually used panel data as the data were analysed only at three specific time points implying cross-sectional data at different time points. Winterberg and Collinson (2007b) population was not homogenous because they compared national survey made of black and whites with a rural South African population with different household definitions. Also the case definition of household formation was inappropriate. The relocation of an entire household from one area to another was classified as formation (Wittenberg and Collinson 2007b).

### 1.6.2 Household formation

There is some evidence to suggest there are increasing rates of household formation in South Africa (Wittenberg and Collinson 2007a; Van Zyl, Cross, and Donovan 2008). In Western countries low household formation rates have been studied in the context of economic determinants such as housing or rent prices and unemployment on household formation (Haurin, Hendershott, and Kim 1993; Ermisch and Di Salvo 1997). The decision to stay with parents has been linked with desire to insure against labour market risk (Card and Lemieux 1997; Klasen and Woolard 2009; Kaplan 2012), while parents find co-residence of children as a cheaper way in caring and supporting their children (Rosenzweig and Wolpin 1994). This could have contributed to the low household formation seen in western countries. Housing prices, individual and parental income and choices have been the focus for Western based studies. The implicit assumption in such studies is that parents are altruistic (Rosenzweig and Wolpin 1994).

Nevertheless, some children may also be altrusic to parents and may decide to cohabit and care for their aged parents (Fafchamps and Quisumbing 2007).

In contrast, in South Africa there appears to be an increase in household formation rates (Van Zyl, Cross, and Donovan 2008). The increasing household formation rates documented in South Africa may be attributed to the breaking up of individuals from existing households as a result of the increased acessibility to housing, land and goverment grants in post apartheid era (Wittenberg and Collinson 2007b; Van Zyl, Cross, and Donovan 2008). Goverment interventions through cash transfers such as child grants usually received by women may be an important reason for individuals (women especially) to split and form new households for independence (Van Zyl, Cross, and Donovan 2008).

Studies on household formation in South Africa have paid specific attention to economic determinants especially to employment and grants while neglecting other SES aspects such as education and household wealth index, a limitation noted by Keller (2004). Also,Klasen and Woolard (2009) found that, unemployment in the absence of state support in form of grants delays the formation of households by individuals.

### 1.6.3 Household dissolution

Studies on household dissolution are limited. Many studies have limited dissolution to marital dissolution (Tamborini, Iams, and Reznik 2012; Hill 2004). The definition of household and household dissolution is further another problematic area for the available limited literature. For example Bowles and Garoupa (Bowles and Garoupa 2002) defined household dissolution from a marriage prospective, while Urassa (2001) defined dissolution as the break down or departure of whole household members from a dwelling. In this study we adopt the definition of household dissolution similar to that used by Hosegood et al. (2004), who defined household dissolution as the breakup of the household (Hosegood et al. 2004).

About 2% of households as at 2002 have dissolved in the study area (Hosegood et al 2004), while (Wittenberg and Collinson 2007b) states an increased rate of dissolution 3.6% in Agincourt, rural Mpumalanga South Africa. Previous studies have identified several demographic and socioeconomic determinants of household dissolution. Bigger households and households with older household heads were less likely to dissolve (Sartorius et al. 2014). The attachment of unemployed individuals to other households who are better off or in receipt of government grants or other forms of support is a form coping mechanism for the unemployed but. this coping strategy may burden the receiving household and in time result dissolution (Klasen and Woolard 2009).

Other studies have focused on adult/household head mortality especially attributed to HIV and migration on household viability and dissolution (Hosegood et al., 2004, Urassa et al., 2001). Deaths of adult household members could as well result in household dissolution especially in cases where deaths are multiple or sudden (result of accidents and violence) (Gregson, Mushati, and Nyamukapa 2007; Hosegood et al. 2004; Urassa et al. 2001).

There are some clear limitations in the literature on household dissolution. There has been a narrow focus on a single SES (Hosegood et al. 2004; Klasen and Woolard 2009) and potentially problematic household dissolution definition such as definition of the departure of an entire household from a dwelling as dissolution. This for example likely inflated household dissolution rates in the Tanzania study (Urassa et al. 2001). Also, a household defined using the co-resident concept (Gregson, Mushati, and Nyamukapa 2007) does not particularly account for the dynamic and complex living arrangements of South African households.

### 1.6.4 Migration

South Africa is a highly mobile population with more than 10% of the population migrating within the country in the post-apartheid era (Kok and Collinson 2006). About 7% of the mid –

year population migrate annually in rural KwaZulu-Natal commonly among unmarried, uneducated young adults and children(Muhwava et al. 2013). However some studies found those with higher education and males are more likely to migrate (Junming 1997; Klasen and Woolard 2009). Migration could be a response to better opportunities like jobs, marriages and housing in the destination areas (Junming 1997; Muhwava et al. 2010). Unemployment could result in higher rates of migration of individuals to urban centres and/or to join other households to cope with hardships (Van Zyl, Cross, and Donovan 2008; Madhavan and Schatz 2007; Klasen and Woolard 2009). Other reasons for migration include for better infrastructure, schools and hospitals and social networks (Cross and Thembambhele 1998). Also, migration in response to a crisis could result in the sending of children and dependents to other relatives and friends in the short term (Hosegood et al. 2004).This could in the long-term result in the dissolution of household as noted by Klasen and Woolard (2009).This implies, permanent migration of individuals is associated with the dissolution of individuals initial/abandon households(Sartorius et al. 2014)

### 1.6.5 Marriage

Marriage is an important determinant of household formation and stability (Fafchamps and Quisumbing 2007). However the recent decline in marriage rates and increase in divorce in young adults is a concern for demographers, health researchers and policy makers. According to the 2012 South Africa census a 3.7% reduction in marriages was recorded between 2011 and 2012 (Statistics South Africa 2012b). The high cost of bride prices in South Africa has been identified as a contributory factor to low marriage rates (Posel, Rudwick, and Casale 2011). Other reasons for the low marriage rates include the effect of post-apartheid policies, family separation and child bearing traditions (Hosegood, McGrath, and Moultrie 2009; Marston et al. 2009). In addition, an important reason why older children co-reside with parents is a result of

the low marriage rates (Umberson, Pudrovska, and Reczek 2010). Similar trends have been recorded in the United States of America (USA). The proportion of adults in the USA population aged 18 and above who remained unmarried from the 1960 – 2011 generation has almost doubled from 28% - 49% (Taylor et al. 2011).

Majority of households are made up of couple relationships which suggest the fact that, a vast majority of households are formed on the basis of marriage. Marriage entails reproduction and companionship (Fafchamps and Quisumbing 2007). But as sexual attractiveness decreases with age coupled with the raising rates of extra marital affairs is likely to increase divorce rates Household dissolution may be a consequence (Fafchamps and Quisumbing 2007).

## 1.7 Conceptual Frame work

Figure 1.1 shows a conceptual framework which serves as a rationale to this research and guides in understanding the socioeconomic determinants of household formation and dissolution while accounting for other factors that interplay in the causal mechanism. The access of household members to employment, education, grants and basic household assets directly influence the SES of households. Household demographic variables such as household size, sex of household head, residential location of household and the marital status of household head could as well impact on households SES circumstances of households. Household socioeconomic status could have a relation to marital status of household head, mortality and in/out migration of main bread winner and productive members of a household. Death of its members may result due to the inability of household members to meet their basic necessities such as health care, portable water and food. This may consequently result in the dissolution of households. The formation of new households may as well be influenced by marriage and in migration. The main exposure SES are education, household grant recipients, employment of household members and a wealth index generated from a principal component analysis. The receipt of government cash transfers in the form of

child, disability and old age grants were also explored in (see Figure 1.1 Conceptual frame work).

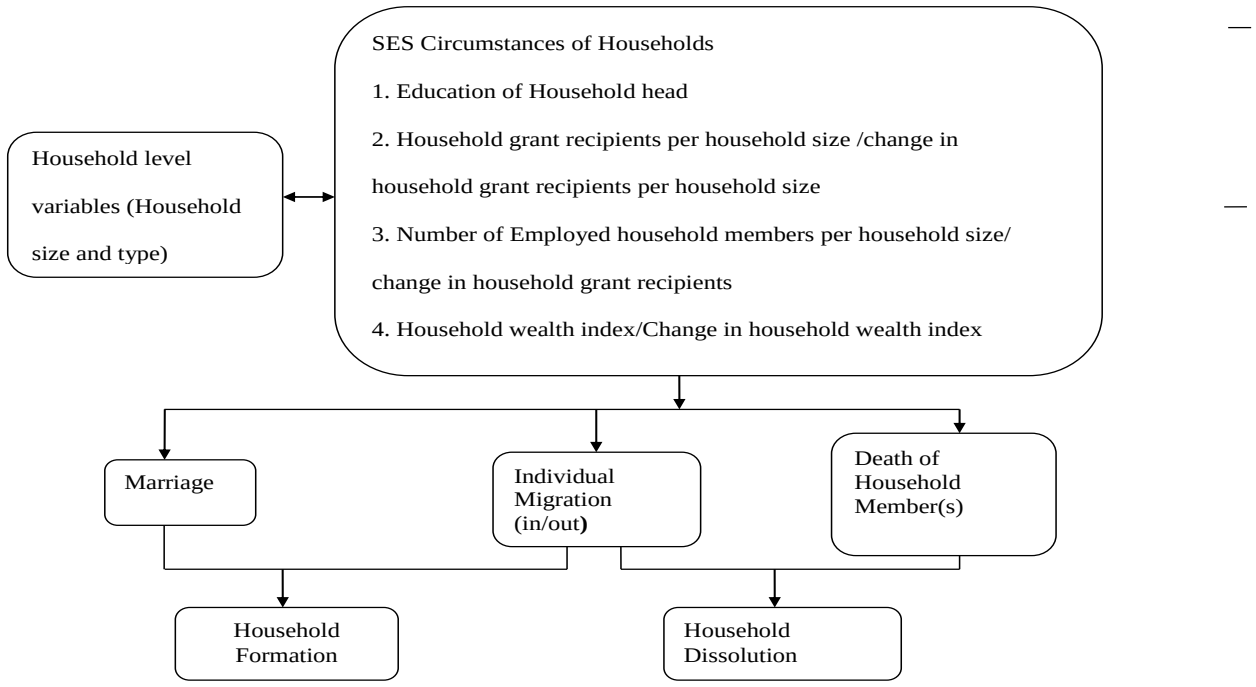



**Figure 1-1: Conceptual Frame work of Household Formation and Dissolution**

## 1.8 Hypotheses

The three main hypotheses to be tested in this study are:

### 1.8.1 Hypothesis 1

Households with high socioeconomic status are more likely to be newly formed households. This hypothesis was formed based on some studies in South Africa. For example Klasen and Woolard, (2008) showed that, unemployment in the absence of state support delayed the formation of households by individuals, while Van Zyl (2008) relates household formation to access to government grants. These studies are both suggestive of household formation being associated with higher socio-economic status.

### 1.8.2 **Hypothesis 2**

Poorer households are more likely to dissolve, as suggested by Hosegood (2004) and others. The burden of dependents (unemployed adult household members and children) on households could strain and cause the dissolution of households in the long-term (Hosegood et al. 2004; Klasen and Woolard 2009). It has also been found that a good SES is critical to maintain and sustain households (Conger, Conger, and Martin 2010).

### 1.8.3 **Hypothesis 3**

Households that experience improvement in their SES are less likely to dissolve. This is premised on among others a study by Sartorius (2014) conducted in rural South Africa that showed that a positive change in a household socio-economic position is less likely to result in household dissolution.

## 1.9 Expected contribution

Some work has been done on possible link between socioeconomic status and household dynamics particularly household formation. This study differs from previous studies in many ways. The presence of longitudinal data specifically, household formation and dissolution over the study period and the use of socioeconomic data at baseline and end line to measure change in household SES. Also, most studies are limited to marital dissolution and formation (Bowles and Garoupa; 2003; and Schneider; 2013). The study setting is from an African prospective severely affected by HIV. This study will examine the effect of household head education, wealth index, grant recipients and employed household members on the two study outcomes, household formation and dissolution, in the setting of severe HIV epidemic impact.

# 2 CHAPTER TWO - METHODOLOGY

## 2.1 Materials and methods

This chapter introduces the reader to the methods employed in the study. It entails information about the study site, population, sample size, study design, descriptive characteristics of study sample, data collection and validation procedures. The chapter describes the inclusion and exclusion criteria with the aid of a flow diagram and gives a detailed description of the dynamics of households observed over the study period. It further discusses data entry and quality control techniques used in data entry and the extraction and management of data for statistical analysis. The chapter also gives information on the ethical procedures put in place for the conduct of the study and limitations of study.

## 2.2 Study Site

The study was based on data from a longitudinal surveillance site run by the Africa Centre for Health and Population Studies (henceforth Africa Centre) and is located 250 km north of Durban, KwaZulu-Natal province South Africa. The population in the study area is almost entirely of the Zulu tribe. The surveillance area covers a total area of 438 km2 accommodating approximately 90, 000 people (Tanser et al. 2008). As at 2003, 11834 households were in the surveillance area. The area is predominantly rural with one urban township Mtubatuba close by and a few peri-urban locations. Large SES differentials exist in the area with respect to education, living standards and access to portable drinking water and electricity with an annual per capita income of US$1730 (Solarsh et al. 2002) compared to a national annual per capita income of US$12722 purchasing power parity(Fund 2014). A large percentage of the population depend on wages and pensions with only a small proportion partaking in agricultural activities (Tanser et al. 2008). However, SES is generally improving over time. As of 2006, 78% of

households had access to piped water and 62% had access to electricity supply (Taylor et al. 2015).

The Africa Centre routinely collects health and demographic data on all households within a geographically defined area. At inception in 2000, all households within the catchment area were mapped and registered with special codes with the help of the geographical information system. This facilitates entire coverage of all households and aid with the location and field follow-up visits by field workers. The collection of demographic data – births, deaths, population movement and household memberships was initially being done in bi-annual rounds but since 2012 it is done every 4 months on all households in the surveillance area. Whereas once in a year, information is collected on individual and household socio-economic characteristics like employment status, education attainment, receipt of grants and household asset ownership.

### 2.2.1 Descriptive characteristics of the study sample

Figure 2.1 shows a flow diagram on the procedures and steps that resulted in the number of households included in the final analysis. A total of 19,451 households have existed in the study area over the study period, 2003-2012. Out of this, 310 households were registered as having migrated as a unit into study area and did not experience household dissolution so were excluded. Also, the following were also excluded from the analysis: 779 households migrated out of the study area as a whole and did not start with household formation: 63 households which had in-migrated earlier and then out- migrated out of the surveillance within the study period were also excluded, two households with no start date and 48 households had no listed household members. Hence, the final number of households included in the analysis was 18,249 households. The final analytical sample included 5,636 formed households and 2,650 households that dissolved within the study period 2003 – 2012.


**Figure 2-1: A Flow Diagram Showing Sample Inclusion and Exclusion Criteria**

Table 2.1 presents the yearly dynamics of households within study population over the study period. It gives detailed yearly figures of households that were formed, dissolved, immigrated and out-migrated over the study period. It also shows the number of households at the start and end of each study year over the study period .An increase in households was observed yearly although household outmigration constantly increased yearly as over the period With regards to

household formation, dissolution and immigration, there was no observed consistency in increment or decrement in the yearly figures (see Table 2.1 below).

**Table 0-1: The dynamics of households in the study area over the study period**

| Year | Starting Population | Household Formation | Household Dissolution | Household Outmigration | Household In-migration | End Year Population |
|---|---|---|---|---|---|---|
| 2003 | 11176 | 515 | 265 | 81 | 91 | 11436 |
| 2004 | 11436 | 543 | 206 | 91 | 103 | 11785 |
| 2005 | 11785 | 614 | 263 | 48 | 108 | 12196 |
| 2006 | 12196 | 678 | 392 | 32 | 112 | 12562 |
| 2007 | 12562 | 476 | 386 | 87 | 108 | 12673 |
| 2008 | 12673 | 611 | 291 | 57 | 110 | 13046 |
| 2009 | 13046 | 711 | 263 | 78 | 125 | 13541 |
| 2010 | 13541 | 6599 | 181 | 107 | 181 | 14093 |
| 2011 | 14093 | 493 | 206 | 119 | 130 | 14391 |
| 2012 | 14391 | 336 | 197 | 100 | 77 | 14508 |

## 2.3 Study Design

The study is a secondary data analysis of longitudinal surveillance data collected by the Africa Centre. The period of observation for this study was from 2003-2012. A longitudinal study design approach was adopted in this study. All households in existence during this ten year period were followed up to determine households that dissolved within the study period.

Household dissolution prevalence by year and factors associated with household dissolution were analysed. Also analysed were prevalence of household formation by year over the study period and factors associated with household formation. The unit of analysis for this study was the household. Individual level factors like employment status, education level and age were aggregated at the household level (see Table 2.2 and 2.3).

## 2.4 Data collection and validation procedures

The Africa Centre used numerous validation procedures to improve the reliability of the surveillance data. This included rigorous trainings provided to field staff, which is the basis for accurate capture of data in the field. The longitudinal nature of the surveillance employs repeated recording of household events and characteristics and updates changes in subsequent visits that helps improve data quality. Quality assurance was done by daily checks on administered questionnaires for missing data and inconsistencies by senior field staff. Also re-fresher training programmes of field workers on questionnaire administration usually 2 – 4 weeks at the start of each surveillance round by well-trained field supervisors are conducted to ensure high quality standards are maintained. Quality control checks were in place at the data collection stage where at least 5% of randomly selected households are revisited by field supervisors. At the data entry level, validation procedures included the return of forms back to the field with errors like missing values, out of range values or inconsistencies.

The year 2003 was considered as start of analysis instead of 2000, the inception year of the Africa Centre because consistent and complete SES information was only available from 2003.

## 2.5 Data entry and management

Data entry in the Africa Centre involved a single entry under a strict monitored computer checklist and constraints to immediately validate entered data using database software.

Data are stored in a relational database using structured query language (SQL) in the ACDIS and are updated every round. Prior to the analysis data were extracted from two main data bases containing the household surveillance (core data set) and household SES survey data, respectively, with the help of a designed checklist. The checklist was used as a guide to extracting data by exporting from SQL to STATA. During data cleaning using the STATA software employed in analysis, frequency and cross tabulations were used to determine missing, duplicates, logical errors and outliers. Also, study participants were linked to their prospective households and bounded structures by unique identifiers for easy tracking in analysis.

## 2.6 Variable definitions

The variables used for the study were classified under three headings: outcome variables; exposure variables and covariates. The outcome variables were household formation and dissolution. They were analysed using as two separate models. These are defined in Table 2.2.

The exposure variables were the socioeconomic variables. These are summarized in Table 2.3. Four main sets of socioeconomic variables were used as alternative measures. For Household formation, these SES variables included: a) a wealth index created using principal component analysis of type and number of household assets; b) household employment status measured at the household level as the number of employed adults 18 years and above in the household; c) Education level of Household head d) At the household level, number of individuals in the household benefiting from government compensations as vulnerable groups such as pension, disability and child support grants and access to government grants by individual household members and number of individuals who receive government cash transfers in household.

For household dissolution, household grants, employment, education of household head and the wealth index was explored. Specifically, in terms of their transition at the start and end of

household observation so as to observe if these changes were positive, negative or no change at all.

The final categories of variables are covariates of household formation and dissolution – they are associated with both household formation and dissolution and socioeconomic status. The factors to be included in the analysis are household size and type, migration, household deaths, sex of household head, age of household head, religion and residential location. These were controlled for during the analysis stage. Covariates are presented in Table 2.4. However, the choice of inclusion of these covariates into the two separate models was independent by univariate analysis at 5% significance level .Priori were included in models were necessary. This implies that, the two different models are unique in terms of the choice of covariates.

**Table 0-2: Outcome variables**

| Outcome variable | Definition |
|---|---|
| Household dissolution | Household dissolution was defined as the end of all individual household memberships as a result of death and/or out-migration of individual household members either outside or within the surveillance area. An entire household out-migration was not regarded as dissolution because these households still exist. This variable was coded as "1" for households that dissolve over the period and "0" for those that do not. |
| Household formation | Household formation occurred when an individual or group of persons from different households either pre- |

| | |
|---|---|
| | existing within the surveillance area or in-migrated from different households outside the surveillance come together to form new households. This variable was coded "1" for new households formed within the study period and "0" for pre-existing households. |

**Table 0-3: Socioeconomic (Exposure) variables**

| Socio economic variables | Type of variables collected |
|---|---|
| Generation of household socio-economic status using wealth index. | A wealth index was created from the number and types of assets owned in household such as livestock; furniture, stove, radio, TV, sources of energy etc. The index was classified as "1" for very poor, "2" for poor, "3" for average, "4" for rich and "5"for very rich. |
| Employment (Household level) | Number of adults 18 years and above employed in the household. |
| Education of household head (Household level) | Education of household head was explored as a categorical variable. Coded "0" for none "1" for primary, "2" for secondary "3"for tertiary and "7" for missing |
| Government cash transfers (Household level) | Number of individuals in households receiving government cash transfers or grants. |
| Change in wealth index | Examined wealth index per household size of every household at start and end of household observation to determine if change is positive, negative or constant over study period taking into account household size at baseline and end line. This variable was coded "0" for no change "1" for positive change, "2" for a negative change in the wealth index, and "3"for households with SES data collected at only a single time point. |
| Change in household grant | This variable is created similar to the wealth index but as |

| | |
|---|---|
| recipients | with respect to changes in number of household grant recipients and classified as "0" for no change "1"for positive change, "2"for a negative change |
| Change in number of employed household members | Also, similar to above, it is generated from differences in observed employed members per household size at start and end of household per household size and classified as "0" for no change "1"for positive change, "2"for a negative change. |

**Table 0-4: Other study covariates**

| | |
|---|---|
| Sex of Household head | This was a categorical variable. Code "1" for male and "2"for female. |
| Household size | Number of individuals in household who are considered as resident members categorised as single member, 2-4 members and greater than 4 household members. |
| Individual immigration | Movement of individuals from outside or within the surveillance area could subsequently lead to break away of households and/or the formation of new households. The variable was coded as "0" for households where there is no individual in-migrants, "1" where a single person migrate into the household and "2" when two or more individuals migrate into a household. |
| Individual out-migration | Migration of an individual member out of a household could trigger household. This variable was classified as"0" for the absence of individual out- migration "1"for the |

| | |
|---|---|
| | presence of an out-migration of a single household member and "2" for out-migration of more than one house member. |
| Dead and Sex of deceased member | Coded as "1" for male, "2" for female and "3"for the presence of both male and female deaths in household. |
| Proportion of dead household members | A continuous variable that was generated from the number of dead household members per the size of household at the end of household observation |
| Marital Status of Household head | This is marital relationship of the household head. "0" for never married "1" for married and "2" separated/divorced/widowed. |
| Partnership Status of Household Head | Partnership is coded as "0" for the absence of partnership and "2" for the presence of a partnership. |
| Age of household head | This will include 6 age categories code as "0" for below 20 years, "1" for 20-29, "2" for 30-39 "3"for 40-49, "4" for 50–59 and "5"for 60 and above. |
| Residential Location of Household | Although the study site was generally rural, some areas were more deprived and rural than others. Hence study area was classified "1" for urban, the most urbanised areas, "3" for rural for the most deprived sections of the study area and "2" for periurban, the intermediate between the urban and rural areas (semi-urban). |

| | |
|---|---|
| Religion | Main religion of household head. It would be recoded "0" for not belonging to any religion, "2"for Christianity and "3"for others. |

## 2.7 Statistical analysis

All analyses were conducted using STATA version 12.In describing the prevalence of household formation and dissolution, graphs were used to determine the percentage of newly formed and dissolved households within the surveillance area over the study period.

Bivariate analysis employed chi-square tests for categorical comparisons of variables while univariate analysis included separate logistic regressions for household formation and dissolution since the outcomes are dichotomous variables. Also, variables considered significant at 5% were included in multivariable regressions for the two separate models though some insignificant covariates were included as priori.

Multivariate analysis was employed to analyse determinants of household formation and dissolution. This mainly took the form of logistic regression models (dichotomous outcomes). This was achieved by fitting a logistic regression model while adjusting for other significant study covariates. Correlated variables were identified and eliminated by exploring associations between study covariates through frequency tables and pair wise correlation. Also, variance inflation factor was used to avoid multicollinearity. Both the likelihood ratio tests as well as the Hosmer and Lemeshow goodness of fit test were used to determine a model of good fit for the data at 5% significance

## 2.8 Ethical Considerations

An initial consent and information on risk and benefits of study stressing on the free will of participation without coercion has been provided by the primary study and a copy of ethical clearances and consent certificates sought and obtained from the University of KwaZulu-Natal was presented to the University for the parent Study (Ref:E009/00). A data usage agreement for the present study was signed to protect privacy of participants and unauthorised use of the data. These together with the study protocol were further presented to the University of the Witwatersrand Human Ethics Committee for clearance of this study (Ethics clearance certificate number M131154). Copies of the ethics clearance certificates for the current and parent study are attached in appendix I and II. As the study employed a secondary data analysis, data available for analysis was de-identified to ensure confidentiality and stored in a secured password protected computer.

## 2.9 Study Limitations

Findings in this study were limited by the level of missingness in some variables in particular for socio-economic status variables. In most cases there was little that could be done about the missing data as it was an artefact of the surveillance set-up. For instance, when a household is formed it first has to be registered in a particular round. Only after it has been registered can the SES module, which comes with pre-printed information of the household and its members, be assigned to that household in the next surveillance rounds. This means there would generally be a period of 3-6 months between first registration and when the SES information could be collected. In that interval the household could dissolve or out-migrate leading to missing socio-economic status information. Also the fluidity of South Africa households as described by social scientist (Hosegood et al., 2005) allows for inter-household resource sharing. This might not

reflect the true household SES in these households. Additionally, households may have dissolved as a result of positive influences to which this research has not taken into account.

This was a secondary analysis of data collected in routine household demographic surveillance limiting the analysis to the available information and definition of terms and concepts. This study only considered the effect of SES on household formation and dissolution. For a nuanced understanding of the reasons and causes for household formation and dissolution a qualitative study design may be necessary.

Lastly, the study could not explore longitudinally, the changing effect of SES on household dissolution over study period due to the smaller percentages of dissolved households. Hence baseline and end line household SES was used to determine the change in SES over the study period for analysis.

# 3 CHAPTER THREE - RESULTS

This chapter reports the results of the analysis carried out to achieve the objectives of this study as described in Chapter One. A detailed description of the characteristics of the households formed and dissolved is presented with the aid of graphical displays and chi-square tests for comparison of categorical variables. The chapter ends with a univariate and multivariate analysis and a report on the factors associated with household formation and dissolution while adjusting for covariates at the household level.

## 3.1 Descriptive characteristics of household formation

Figure 3.1 shows a line graphing the percentage of newly formed households over the study years within the surveillance area. The line graph shows an “M” shape trend over the study years as the number of new households formed remained relative constant at about 4.4% from 2003 to 2005 and gradually rose to 4.9% in 2006. The percentage of newly formed households declined steadily to 3.2% in 2007 and again, rose steadily in 2008 to 4.4% approximately the same level as at the start of the study period in 2003. Finally, there were steady declines in 2010, 2011 and 2012 to 3.8%, 2.8% and 1.9% respectively.

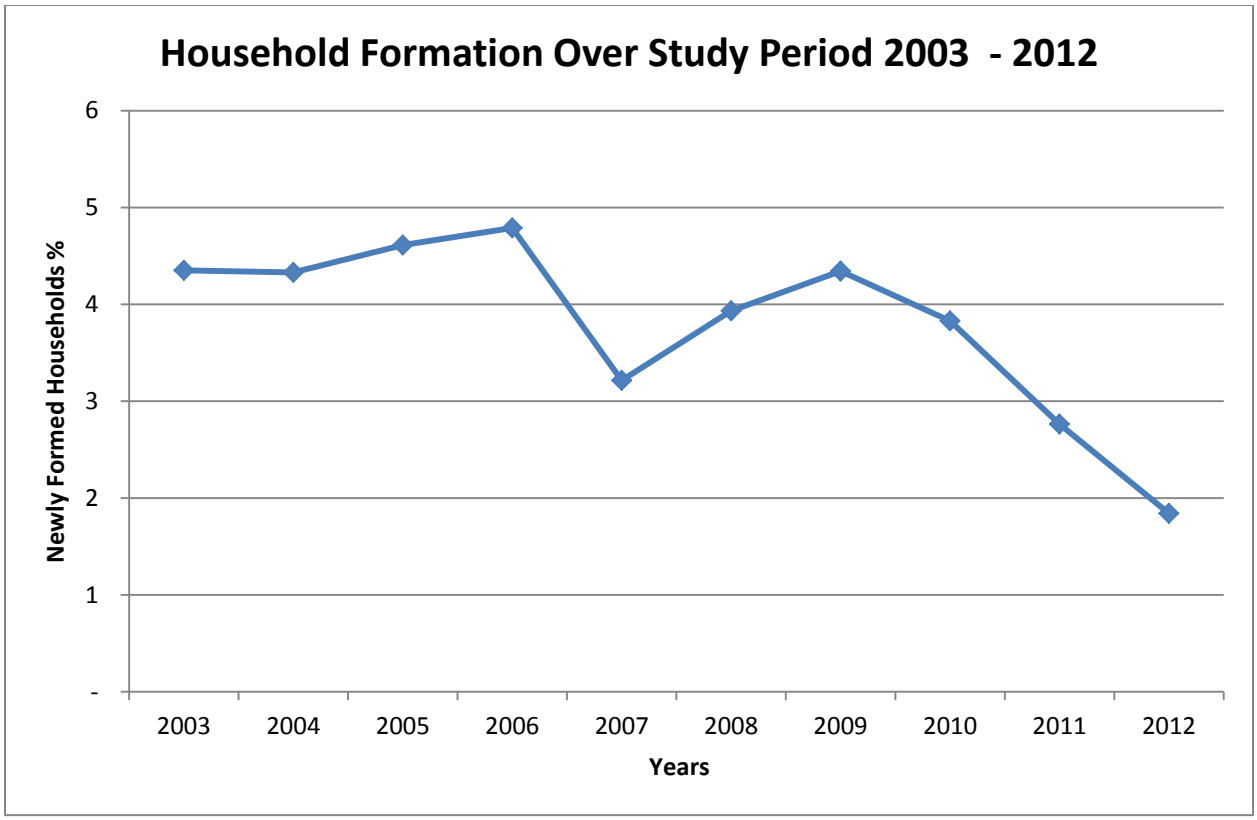



**Figure 3-1: Percentage of Newly Formed Households over Study Period**

Table 3.1 shows some socio-demographic characteristics of newly formed and pre-existing households. As already indicated above, out of the 18,249 households included in the study, 5,636 (30.9%) were formed during the study period. As expected, male-headed households were the majority of both existing and newly formed households, accounting for about 67.0% and 58.9% respectively. A higher majority of newly formed households were headed by never married (70.1%) individuals compared to less than half of household heads being unmarried in pre-existing households (41.4%). However, the partnership status of household heads was very similar between pre-existing and newly formed households with 72.5% and 68.5% in partnerships, respectively. With regards to age of household head, close to one –third of

household heads of newly formed households were in the younger age group 20-39 years, while about a quarter in the pre-existing households were in older age ranges 40-59 years.

Households that were formed over the study period were relatively small in size with about a third of single member households (33.4%) and 40.1% of households with 2-4 members. However, in the pre-existing households about 64.3% of the households had 5 or more members. More than 50% of pre-existing households and more than a one-third of newly formed households were located in rural and peri-urban areas respectively (53.5% and 36.2% respectively).

**Table 3-1**: **Descriptive characteristics of newly formed and pre-existing households at start of household observation**

| Study Variables | Full sample of households | | Pre-existing Households | | Household Formation | | P- values |
|---|---|---|---|---|---|---|---|
| | N | % | n | % | n | % | |
| **Gender of household head** | | | | | | | |
| Male | 11813 | 64.7 | 8494 | 67.3 | 3319 | 58.9 | <0.01 |
| Female | 6350 | 34.8 | 4045 | 32.1 | 2305 | 40.9 | |
| Missing | 86 | 0.5 | 74 | 0.6 | 12 | 0.2 | |
| **Marital status of head** | | | | | | | |
| Never married | 9166 | 50.2 | 5218 | 41.4 | 3948.00 | 70.1 | <0.01 |
| Married | 5383 | 29.5 | 4651 | 36.9 | 732 | 13.0 | |
| Separated/Widowed/divorced | 2902 | 15.9 | 2507 | 19.9 | 395 | 7.0 | |
| Missing | 798 | 4.4 | 237 | 1.9 | 561 | 10.0 | |
| **Partnership status of head** | | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| No partnership | 4341 | 23.8 | 3161 | 25.1 | 1180 | 20.9 | <0.01 |
| In partnership | 13007 | 71.3 | 9148 | 72.5 | 3859 | 68.5 | |
| Missing | 901 | 4.9 | 304 | 2.4 | 597 | 10.6 | |
| **Age of household head** | | | | | | | |
| Under 20 years | 332 | 1.8 | 146 | 1.2 | 186 | 3.3 | <0.001 |
| 20-29 years | 30700 | 16.8 | 1402 | 11.1 | 1668 | 29.6 | |
| 30-39 years | 4991 | 27.6 | 3194 | 25.3 | 1797 | 31.9 | |
| 40-49 years | 4358 | 23.9 | 3292 | 26.1 | 1066 | 18.9 | |
| 50-59 years | 2696 | 14.8 | 2172 | 17.2 | 524 | 9.3 | |
| 60+ | 2714 | 14.9 | 2333 | 18.5 | 381 | 6.8 | |
| Missing | 88 | 0.5 | 74 | 0.6 | 14 | 0.3 | |
| **Household size** | | | | | s | | |
| Single member | 3125 | 17.1 | 1244 | 9.9 | 1881 | 33.4 | <0.001 |
| <5 members | 5418 | 29.7 | 3158 | 25.0 | 2260 | 40.1 | |
| ≥5 members | 9407 | 51.6 | 8114 | 64.3 | 1293 | 22.9 | |
| Missing | 299 | 1.6 | 97 | 0.8 | 202 | 3.6 | |
| **Residence location of household** | | | | | | | |
| Urban | 3089 | 16.9 | 1369. | 10.9 | 1720 | 30.5 | <0.001 |
| | | | 00 | | | | |
| Peri-Urban | 6541 | 35.8 | 4501 | 35.7 | 2040 | 36.20 | |
| Rural | 8619 | 47.2 | 6743 | 53.5 | 1876 | 33.29 | |
| **Religion of household head** | | | | | | | |
| None | 3601 | 19.7 | 2936 | 23.3 | 665 | 11.80 | <0.001 |
| Christian | 8372 | 45.9 | 6809. | 54.0 | 1563 | 27.73 | |
| Others | 242 | 1.3 | 190 | 1.5 | 52 | 0.9 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Missing | 6034 | 33.1 | 2678 | 21.2 | 3356 | 59.6 |

Table 3.2 shows socio-economic characteristics of households. About a third of household heads completed at least secondary school education among those in the newly formed households (33.7% versus 22.9%) compared to those in the pre-existing households. Close to a quarter of household heads had primary or no education at all in the existing households.

The fraction of households who belonged to the poorest and poor quintile was closed to a one-third and a one-quarter respectively in the existing household group (31.8% and 22.6%). However in the newly formed household category, the average and rich categories of the wealth index recorded the highest percentage.

Approximately, 41.6% of newly formed households had no employed members at all, while about 20.8% had only one employed household member among formed households. However, in the pre-existing household category, about a third of household members had at least one employed household member (32.0 %). More than a third (37.1%) of newly formed households had no grant recipients compared to a smaller percentage (8.5 %) in the pre-existing household category.

**Table 3-2: SES Characteristics of newly formed and pre-existing households at start of study**

| Household Characteristics | SES | Total Sample | | Exiting Households | | Household Formation | | P-value |
|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | |
| **Education household head** | | | | | | | | |
| Never been to school | | 3555 | 19.5 | 2918 | 23.1 | 637 | 11.3 | <0.01 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Primary education | 3867 | 21.2 | 3054 | 24.2 | 813 | 14.4 | |
| Secondary education | 4785 | 26.2 | 2886 | 22.9 | 1899 | 33.67 | |
| Tertiary education | 939 | 5.2 | 321 | 2.54 | 618.00 | 11.0 | |
| Missing | 5103 | 27.9 | 3434 | 27.2 | 1669 | 29.6 | |
| **Household wealth quintile** | | | | | | | |
| Poorest | 4821 | 26.4 | 4006 | 31.8 | 815 | 14.5 | <0.01 |
| Poor | 3455 | 18.9 | 2844 | 22.6 | 611 | 10.8 | |
| Average | 3007 | 16.5 | 2138 | 17.0 | 869 | 15.4 | |
| Rich | 2018 | 11.1 | 1131 | 9.0 | 887 | 15.7 | |
| Richest | 2050 | 11.2 | 1322 | 10.5 | 728 | 12.9 | |
| Missing | 2898 | 15.9 | 1172 | 9.3 | 1726 | 30.6 | |
| **Number of household members employed** | | | | | | | |
| None | 5937 | 32.5 | 3594 | 28.5 | 2343 | 416 | <0.01 |
| 1 | 5206 | 28.5 | 4036 | 32.0 | 1170 | 20.8 | |
| 2 | 2177 | 11.9 | 1926 | 15.3 | 251 | 4.5 | |
| >2 | 899 | 4.9 | 850 | 6.7 | 49 | 0.9 | |
| Missing | 4030 | 22.1 | 2207 | 17.5 | 1823 | 32.4 | |
| **Number of grant recipients** | | | | | | | |
| None | 3163.00 | 17.3 | 1073 | 8.5 | 2090 | 37.1 | |
| 1 | 3680.00 | 20.2 | 2399 | 19.0 | 1281 | 22.7 | |
| 2 | 3268.00 | 17.9 | 2607 | 20.7 | 661 | 11.7 | |
| >2 | 5546 | 30.4 | 4965 | 39.4 | 581 | 10.3 | |
| Missing | 2592 | 14.2 | 1569 | 12.4 | 1023 | 18.2 | <0.01 |

## 3.2 Descriptive characteristics of household

Figure 3.2 presents a line graph illustrating the annual household dissolution trends across the study period. There was a general decreased trend in household dissolution across study period from 2.4% in 2003 to 1.6% in 2012. In 2004, the percentage of dissolved households declined steadily to 1.8% and afterwards, rose gradually to 3.3% the highest peak in 2006, after which it again declined as study years progressed to 1.5% in 2010. There was a small increase to 1.7% in 2011 but finally declined to 1.5% in 2012.

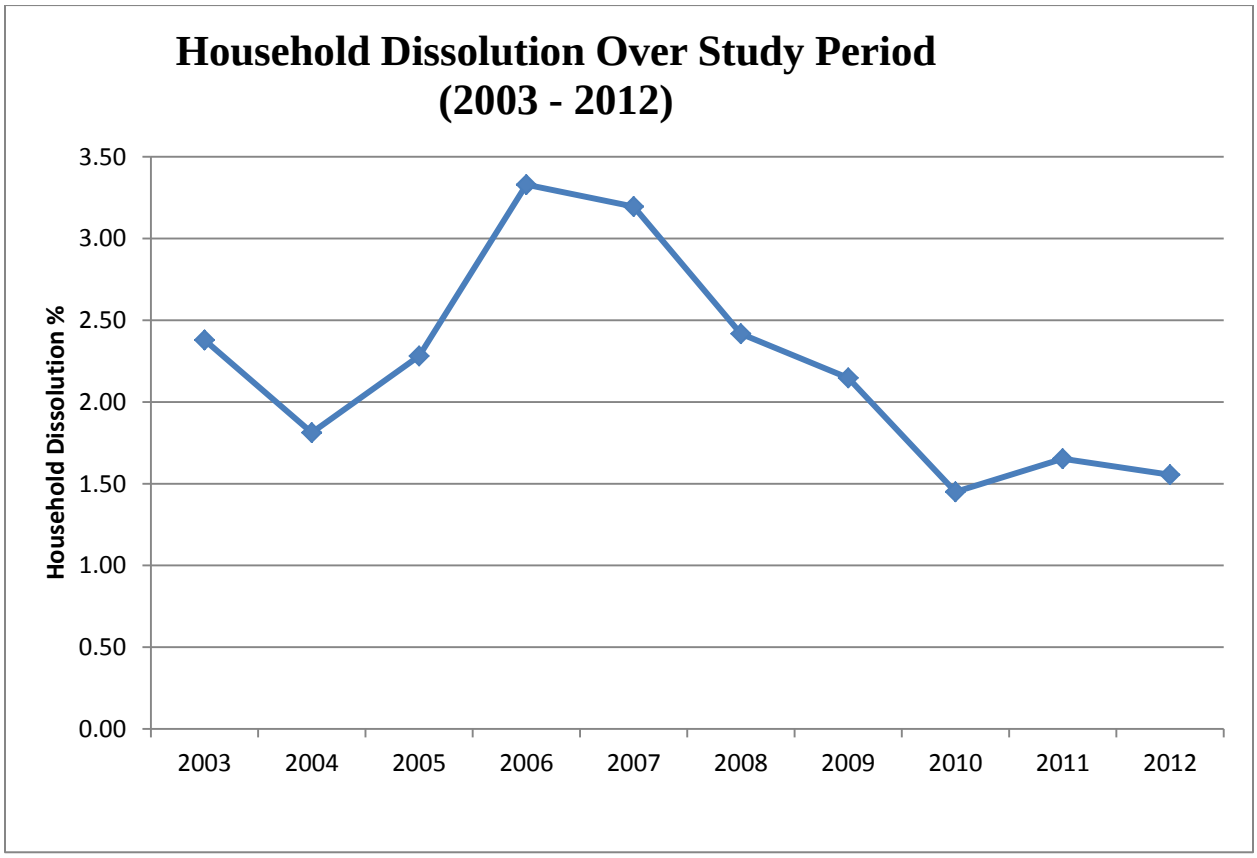



**Figure 3-2: Household Dissolution Trends from 2003 – 2012**

Figure 3.3 shows categories of wealth index transitions from start to end of study among dissolved households. Close to one-third of dissolved households recorded no change in wealth

index quintiles between the beginning and end of household observation. Close to a quarter (24.6%) of households had a positive change in household wealth and approximately 8.6% of households recorded a decline (negative change) in wealth index. Far more than a third of these households had a single socio-economic status measure; hence no change in wealth status over time could be computed.

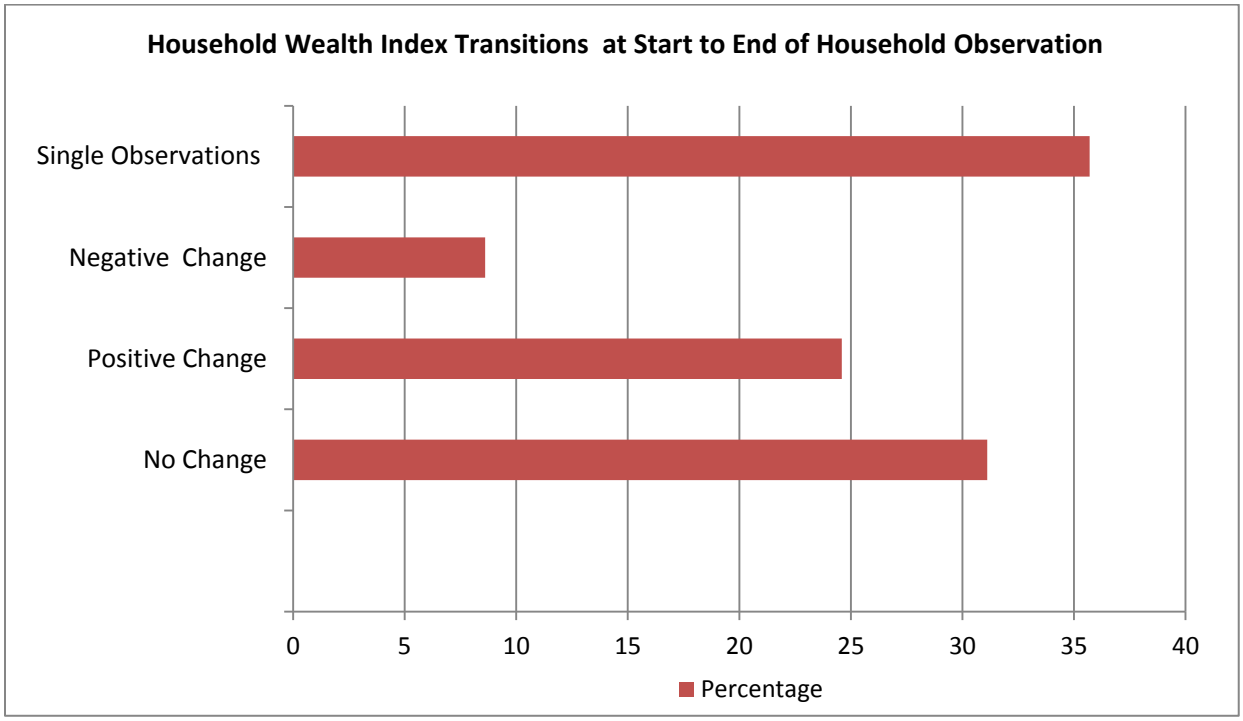



**Figure 3-3: Wealth Index Transitions in Households over Study Period**

Table 3.3 presents description of study characteristics of households that dissolved and households that never dissolved at start and end of household observation. Where start of household observation refers to the first time households were observed within the study period, and end of observation refers to the last time households were observed within the study period or at dissolution for dissolved households. This implies that 2003 is the start of household observation for households that were in existence at the beginning of the study period and

otherwise for households that were formed afterwards. In the same way, 2012 is the end of observation year for households that existed till end of study and for households that ended before study period, the respective end time was regarded as the end of observation period. Out of the total number of households included in this analysis, 2,650 (14.5 %) dissolved while 15,599 (85.5 %) did not dissolve over study period. Male headed households accounted for more than half the number in dissolved households both at start and end of household observation (63.9% and 61.5 %) respectively. Similarly, male headed households accounted for more than half of households that did not dissolve at start and end of household observation (64.9 and 57.0 %) respectively.

The percentage of household heads who never married was 62.7% and 641% respectively at both start and end of household observation. Also, household heads who never married accounted for 48.1% and 50.0% in households that did not dissolve at start and end of household observation respectively. There were similar percentages with a regular partner among heads of households that dissolved or did not dissolve.

As expected, a negligible number of household heads were under 20 years of age in all categories. However, household heads for dissolved households were generally younger both at start and end of household observation. In exact terms, household heads within 20-29 years age range were 23.6% and 17.9% at start and end of household observation respectively in dissolved households. Also, approximately household heads within 30 – 39 age range were 26.9% and 27.7% in dissolved households at start and end of household observation respectively. On the other hand household heads of households that did not dissolve over study period were generally older with 24.3% aged 60 years and above at end of household observation. More than a third of dissolved households had extended families at end of household observation compared to a

negligible number at the start of household observation (36.6% versus 5.2% respectively). However, households that never dissolve over the period recorded 65. 6% of extended family households. Closed to half of dissolved households at start and end of household observation were located in rural areas (45.0% versus 44.9%) respectively with 17.3% and 17.2,% of households dwelling in urban settings at start and end of observation respectively.

Similar to Table 3.1, Christianity is the dominated religion for household heads for both dissolved and undissolved households. Less than half of households experienced deaths in both existing and dissolved households. Out of this, male deaths were slightly higher in the dissolution category as opposed to the undissolved category (16.0% versus 13.6 %).

Majority of undissolved households had highly mobile individuals with about 66.4% having 2 or more individuals immigrating into households within the study period as opposed to 38.4% in the dissolved household category at end of household observation. Similarly, about 58.7% of households with 2 or more members migrated out of households in the undissolved category as opposed to just about one-third in the dissolved household category (32.9%).

Table 3.4 presents SES characteristics of dissolved and undissolved households as at end of observation. About 2 out 10 of heads in households that did not dissolve had no formal education (20.1%) compared to 15.4% among dissolved households. The least educational level for household heads was tertiary education for both dissolved and undissolved households during the study period (3.7 % versus 5.4%) respectively.

At the end of household observation, about 43.4% of households that did not dissolve had a positive change in wealth index compared to 17.4% in the dissolved household category. About a third (33.9%) of households that never dissolved had a positive change in employment compared to 14.9% among households that dissolved. Also, more than a quarter of households that never

dissolved (25.0%) had an increase in the number of grant recipients compared to 15.7% among households that dissolved.

**Table 3-3: Household characteristics of undissolved and dissolved households at start and end of household observation**

| Household characteristics | Characteristics at start of observation | | | | | | | Characteristics at end of observation | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total sample | | Undissolved households | | Dissolved households | | P-Value | Total Sample | | Undissolved households | | Dissolved households | | P-Value |
| | N | % | n | % | n | % | | N | % | n | % | n | % | |
| **Sex of household head** | | | | | | | | | | | | | | |
| Male | 11813 | 64.7 | 10120 | 64.9 | 1693 | 63.9 | | 10525 | 57.7 | 8895 | 57.0 | 1630 | 61.5 | <0.0 |
| Female | 6350 | 34.8 | 5434 | 34.8 | 916 | 34.6 | <0.01 | 7638 | 41.9 | 6659 | 42.7 | 979 | 36.9 | 1 |
| Missing | 86 | 0.5 | 45 | 0.3 | 41 | 1.6 | | 86 | 0.5 | 45 | 0.3 | 41 | 1.6 | |
| **Marital status of head** | | | | | | | | | | | | | | |
| Never married | 9166 | 50.2 | 7504 | 48.1 | 1662 | 62.7 | <0.01 | 9495 | 52.0 | 7797 | 50.0 | 1698 | 64.1 | <0.0 |
| Married | 5383 | 29.5 | 4904 | 31.4 | 479 | 18.1 | | 4463 | 24.5 | 4041 | 25.9 | 422. | 15.9 | 1 |
| Sep/widowed/divorc | 2902 | 15.9 | 2501 | 16.0 | 401 | 15.1 | | 3501 | 191 | 3134 | 20.1 | 367. | 13.9 | |
| Missing | 798 | 4.4 | 690 | 4.4 | 108 | 4.1 | | 790 | 4.3 | 627 | 4.0 | 163. | 6.2 | |
| **Partnership status of household head** | | | | | | | | | | | | | | |
| No partnership | 4341 | 23.8 | 3662 | 23.5 | 679 | 25.6 | ≤0.05 | 5431 | 29.8 | 4757 | 30.5 | 674 | 25.4 | <0.0 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| In partnership | 13007 | 71.3 | 11167 | 71.6 | 1840 | 69.4 | | 11907 | 65.3 | 10156 | 65.1 | 1751 | 66.1 | 1 |
| Missing | 901 | 4.9 | 770 | 4.9 | 131 | 4.9 | | 911 | 5.0 | 686 | 4.4 | 225 | 8.5 | |
| **Age of household head** | | | | | | | | | | | | | | |
| Under 20 years | 332 | 1.8 | 258 | 1.7 | 74 | 2.8 | | 128 | 0.7 | 91 | 0.6 | 37 | 1.4 | <0.0 |
| 20-29 years | 3070 | 16.8 | 2446 | 15.7 | 624 | 23.6 | | 2073 | 11.4 | 1600 | 10.3 | 473 | 17.95 | 1 |
| 30-39 years | 4991 | 27.4 | 4278 | 27.4 | 713 | 26.9 | | 3788 | 20.8 | 3053 | 19.6 | 735 | 27.7 | |
| 40-49 years | 4358 | 23.9 | 3852 | 24.7 | 506 | 19.09 | | 4275 | 23.4 | 3685 | 23.6 | 590 | 22.26 | |
| 50 years | 2696 | 14.8 | 2387 | 15.3 | 309 | 11.7 | | 3671 | 20.1 | 3329 | 21.3 | 342 | 12.9 | |
| 60+ | 2714 | 14.9 | 2332 | 15.0 | 382 | 14.4 | | 4226 | 23.2 | 3795 | 24.3 | 431 | 16.3 | |
| **Household type** | | | | | | | | | | | | | | |
| Single member | 3121 | 17.1 | 2311 | 14.8 | 810 | 30.6 | <0.01 | 2625 | 14.4 | 1795. | 11.5 | 830 | 31.3 | <0.0 |
| Nuclear | 14087 | 77.2 | 12483 | 80.0 | 1604 | 60.5 | | 3989 | 21.9 | 3242 | 20. 8 | 747 | 28.2 | 1 |
| Extended | 589 | 3.2 | 451 | 2. 9 | 138 | 5.2 | | 11197 | 61.4 | 10227 | 65.6 | 970 | 36.6 | |
| Missing | 452 | 2.5 | 354 | 2.3 | 98 | 3.7 | | 438 | 2.4 | 335 | 2.2 | 103 | 3.9 | |
| **Residence location of household** | | | | | | | | | | | | | | |
| Urban | 3089 | 16.9 | 2631 | 16.9 | 458 | 17.3 | ≤0.05 | 3097 | 17.0 | 2641 | 17.0 | 456 | 17.2 | ≤0.0 |
| Peri-urban | 6541 | 35.8 | 5542 | 35.5 | 999 | 37.7 | | 6561 | 36.0 | 5557 | 36.0 | 1004 | 37.9 | 5 |
| Rural | 8619 | 47.2 | 7426 | 47.6 | 1193 | 45.0 | | 8591 | 471 | 7401 | 47.5 | 1190 | 44.9 | |
| **Religion of household head** | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| None | 3601 | 19.7 | 3072 | 19.7 | 529 | 20.0 | <0.01 | 3315 | 18.2 | 2782 | 17.8 | 533 | 20.1 | |
| Christian | 8372 | 45.9 | 7333 | 47.0 | 1039 | 39.2 | | 8603 | 47.1 | 7573 | 48.6 | 1030 | 38.9 | <0.0 |
| Others | 242 | 1.3 | 205 | 1.3 | 37 | 1.4 | | 250 | 1.4 | 213 | 1.4 | 37 | 1.4 | 1 |
| Missing | 6034 | 33.1 | 4989 | 32.00 | 1045 | 39.4 | | 6081 | 33.3 | 5031 | 32.3 | 1050 | 39.6 | |
| **Sex of deceased household members** | | | | | | | | | | | | | | |
| None | | | | | | | | 10580 | 58.0 | 9013 | 57.8 | 1567 | 59.1 | <0.0 |
| Male | | | | | | | | 2546 | 14.0 | 2121 | 13.6 | 425 | 16.0 | 1 |
| Female | | | | | | | | 2851 | 15.62 | 2443 | 15.7 | 408 | 15.4 | |
| Both Male and Female | | | | | | | | 2272 | 12.45 | 2022 | 13.0 | 250 | 9.4 | |
| **In-migration of household members** | | | | | | | | | | | | | | |
| None | | | | | | | | 1983 | 10.9 | 1539 | 10.0 | 444 | 16.8 | <0.0 |
| 1 In-migration | | | | | | | | 4884 | 26.8 | 3697 | 23.7 | 1187 | 44.8 | 1 |
| ≥2 In-migration | | | | | | | | 11382 | 62.4 | 10363 | 66.4 | 1019 | 38. 5 | |
| **Out-migration of household members** | | | | | | | | | | | | | | |
| None | | | | | | | | 2999 | 16.4 | 2379 | 15.3 | 620 | 23.4 | <0.0 |
| 1 In-migration | | | | | | | | 5223 | 28.6 | 4065 | 26.1 | 1158 | 43.7 | 1 |
| ≥2 In-migrations | | | | | | | | 10027 | 55.0 | 9155 | 587 | 872 | 32.9 | |

**Table 3-4: SES characteristics of dissolved and undissolved households**

| SES Characteristics | Total sample | | Undissolved Households | | Dissolved Households | | P-Value |
|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | |
| **Education of household head** | | | | | | | |
| Never been to school | 3555 | 19.5 | 3146 | 20.1 | 409 | 15.4 | <0.01 |
| Primary education | 3867 | 21.2 | 3443 | 22.0 | 424 | 16.0 | |
| Secondary education | 4785 | 26.2 | 4137 | 26.5 | 648 | 24. 5 | |
| Tertiary education | 939 | 5.2 | 841 | 5.4 | 98 | 3.7 | |
| Missing | 5103 | 28.0 | 4032 | 25.9 | 1071 | 40. 2 | |
| **Change in wealth index** | | | | | | | |
| **No change** | 4466 | 24.5 | 3884 | 24.9 | 582 | 22.0 | <0.01 |
| Positive change | 7223 | 39.6 | 6763 | 43.4 | 460 | 17.4 | |
| Negative | 1053 | 5.8 | 892 | 5.7 | 161 | 6.1 | |
| Single Observations | 2445 | 13.4 | 1777 | 114 | 668 | 25.2 | |
| Missing | 3062 | 16.8 | 2283 | 14.6 | 779 | 29.4 | |
| **Change in employment** | | | | | | | |
| No change | 2322 | 12.7 | 1901 | 12.2 | 421 | 15.9 | <0.01 |
| Positive change | 5676 | 31.1 | 5282 | 33.9 | 394 | 14.9 | |
| Negative | 3596 | 19.7 | 3385 | 21.7 | 211 | 8.0 | |
| Single Observations | 1641 | 9.0 | 1140 | 7.3 | 501 | 18.9 | |
| Missing | 5041 | 27.5 | 3891 | 24.9 | 1123 | 42.4 | |
| **Change in grant** | | | | | | | |
| No change | 1577 | 8.6 | 1312 | 8.4 | 265 | 10.0 | <0.01 |
| Positive change | 4317 | 23.7 | 3901 | 25.0 | 416 | 15.7 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Negative | 6295 | 34.5 | 5834 | 37.4 | 461 | 17.4 |
| Single Observations | 1745 | 9.6 | 1215 | 7.8 | 530 | 20.0 |
| Missing | 4315 | 23.7 | 3337 | 21.4 | 978 | 36.9 |

## 3.3 Factors Associated with Household Formation

Table 3.5 shows the univariate and multivariate regression model results of factors associated with household formation. Hosmer-Lemeshow goodness of fit of the model was estimated at P-value =0.22. Hence, the model is a good fit of the data. Apart from partnership status and religion of household head, all variables were significant for the univariate analysis.

After controlling for covariates such as marital status of household head, household size, age of household head, residential location, and sex of household head, it was found that, the higher a household head's education the more likely to form new households relative to household heads who had no education at all. Households with heads with tertiary level of education were associated with about thrice the odds of being in newly formed households compared to the reference category of no education (aOR =2.96, 95% confidence interval (CI) 2.26-3.89).

Also, with regards to employment, households with employed members were associated with lower odds of being newly formed. In detail, households with one employed member was associated with 0.43 times the odds of being newly formed compared to households with no employed member (aOR =0.57, 95% (CI) 0.50-0.65). Whereas the odds of households with more than 2 employed members were 0.69 times the odds of being newly formed than households with no employed member (aOR =0.31, 95% (CI) 0.21-0.45).

Similar to household employment, households with a higher number of grant recipients were less likely to be newly formed. Households with one grant recipient were associated with 72% lower

odds of being newly formed than households with no grant recipients at all (aOR =0.28, 95% (CI) 0.23-0.33). While households with more than 2 grant recipients were significantly associated with 0.85 times the odds of being newly formed compared to households with no grant recipients (aOR=0.15, 95% (CI) 0.12-0.18).

However, households with a higher wealth quintile relative to a lower wealth quintile were more likely to be formed. In exact terms, households in the richest quintile of the wealth index were twice as high of being newly formed households compared to households in the poorest wealth quintile (aOR =2.21, 95% (CI) 1.72-2.84). Similarly the odds of a household being in the rich wealth quintile were significantly associated with thrice as high the odds of being newly formed compared households in the poorest wealth quintile (aOR =3.29, 95% (CI) 2.69-4.04). Being in the average category was associated with approximately twice as high the odds of being a newly formed household compared to the poorest category of the wealth index (aOR =1.53, 95% (CI) 1.28-1.84).

The odds of household being headed by a female were about twice as high to be newly formed compared to male headed households (aOR =2.23, 95% (CI) 1.93-2.57). Married household heads were associated with 0.53 times the odds of being newly formed relative to never married among newly formed households (aOR =0.47, 95% (CI) 0.40-0.55). Additionally, household heads that were separated or divorced were associated with 0.73 times the odds of being a newly formed compared to never been married household heads (aOR =0.27, 95% (CI) 0.22-0.33).

The greater the size of households, the less likely they were newly formed. Households with 2-4 members had 32% lower odds of being a newly formed households compared to households with just a single member (aOR =0.68, 95% (CI) 0.56-0.80). Comparably, households with 4 or more

members were associated with 63% lower odds of being newly formed households relative to households with single members (aOR =0.37, 95% (CI) 0.30-0.46).

Compared to being in an urban areas, households in peri-urban areas were associated with 29% lower odds of being newly formed (aOR =0.71, 95% (CI) 0.58-0.86). Age of household head however, was not significantly associated with household formation.

**Table 3-5*: Univariate and multivariate results of factors associated with household formation***

| Variable | Univariate | | Multivariate | |
|---|---|---|---|---|
| | OR 95% CI | P-Value | OR 95% CI | P-Value |
| **Education of household head** | | | | |
| Never been to school | Ref | | Ref | |
| Primary education | 1.22(1.07-1.38) | <0.01 | 1.06(0.89-1.23) | <0.01 |
| Secondary education | 2.6(2.32-2.92) | | 1.19(0.99-1.43) | |
| Tertiary education | 9.95(8.34-11.87) | | 2.96(2.26-3.89) | |
| **Number of members employed** | | | | <0.01 |
| None | Ref | | Ref | |
| 1 | 0.46(0.43-0.51) | | 0.57(0.50-0.65) | |
| 2 | 0.22(0.19-0.26) | | 0.46(0.37-0.57) | |
| >2 | 0.10(0.77-0.14) | | 0.31(0.21-0.45) | |
| **Number of grant recipients** | | | | <0.01 |
| None | Ref | | Ref | |
| 1 | 0.29(0.26-0.32) | | 0.28(0.23-0.33) | |
| 2 | 0.14(0.13-0.16) | | 0.21(0.17-0.25) | |
| >2 | 0.06(0.57-0.07) | | 0.15(0.12-0.18) | |
| **Household wealth quintile** | | | | |
| Poorest | Ref | | Ref | |
| Poor | 1.02(0.91-1.15) | <0.01 | 1.17(0.99-1.40) | <0.01 |
| Average | 1.96(1.75-2.19) | | 1.53(1.28-1.84) | |
| Rich | 3.76(3.34-4.24) | | 3.29(2.69-4.04) | |
| Richest | 2.67(2.36-3.01) | | 2.21(1.72-2.84) | |
| **Sex of household head** | | | | |
| Male | Ref | | Ref | |
| Female | 1.59(1.48-1.72) | <0.01 | 2.22(1.93-2.57) | <0.01 |
| **Marital status of household head** | | | | |
| Never married | Ref | | Ref | |
| Married | 0.22(0.2-0.24) | <0.01 | 0.47(0.40-0.55) | <0.01 |
| Separated/Widowed/divorced | 0.23(0.2-0.26) | | 0.27(0.22-0.33) | |
| **Household size** | | | | |
| Single members | Ref | | Ref | |
| <5 members | 0.48(0.43-0.54) | <0.01 | 0.68(0.56-0.80) | <0.01 |
| ≥5 members | 0.12(0.1-0.13) | | 0.37(0.30-0.46) | |
| **Residential location** | | | | |
| Urban | Ref | | Ref | |
| Peri-urban | 0.33(0.3-0.36) | | 0.71(0.58-0.86) | <0.01 |
| Rural | 0.21(0.19-0.24) | <0.01 | 1.09(0.87-1.35) | |

| | | | | |
|---|---|---|---|---|
| **Age of household head** | | | | |
| Under 20 | Ref | | Ref | |
| 20-29 years | 1.11(0.82-1.5) | | 1.54(0.98-2.40) | ≤0.05 |
| 30-39 years | 0.54(0.4-0.72) | <0.01 | 1.34(0.86-2.08) | |
| 40-49 years | 0.33(0.25-0.45) | | 1.25(0.80-1.97) | |
| 60+ | 0.71 (0.48-1.06) | | 1.45 (0.75-2.80) | |
| **Partnership status** | | | | |
| No partnership | Ref | | | |
| In partnership | 1.06(0.97-1.16) | >0.05 | | |
| **Religion of household head** | | | | |
| None | Ref | | | |
| Christian | 0.82(0.74-0.92) | | | |
| Others | 1.23(0.77-1.96) | | | |

NB: A total of 2965 households were excluded in the regression analysis because of refusal to participate in household SES surveys.

## 3.4 Factors Associated with Household Dissolution

Table 3.6 shows the univariate and multivariate regression results for household dissolution. In univariate analysis marital status of household head, household type, age of household head, residential location and sex of household head, gender of deceased household members were associated with household dissolution The Hosmer - Lemeshow goodness of fit of the model was estimated at a P-value of 0.46, implying the model is a good fit of the data. Over the study period, an increment in the number of employed household members was associated with 0.49 times the odds of being a dissolved household as compared with households with an unchanged number of employed members at start and end of observation (aOR =0.51 95% (CI) 0.42-0.61). While households who were observed once within the study period were associated with 6.55 times as high the odds to dissolve compared to households with no change in wealth index (aOR =6.55 95% (CI) 2.08-20.62).

Additionally, the odds associated with an increment in the number of grant recipients over the period of observation were 0.69 times likely to dissolve compared to households that had unchanged grant recipients (aOR =0.31 95% (CI) 0.25-0.39).

Households with an improved wealth index over the period of study were associated with a 55% lower odds of dissolving compared with households whose wealth index remained stable (aOR =0.45, 95% (CI) 0.38-0.54).

As expected, households that experienced male deaths were twice as high likely to dissolved compared to households with no deaths at all (aOR = 2.37; 95% (C1) 1.92 – 2.92). Similarly, although with a weaker association, households that recorded female deaths only were associated with 1.68 higher odds of being dissolved compared to households that experienced no death at all (aOR =1.68; 95% (CI) 1.35-2.0). While households that experienced both male and female deaths were twice as likely of being dissolved compared to households who never experience a death at all (aOR =2.07; 95% (CI) 1.62-2.64).

Female headed households were associated with 0.19 times the odds of being dissolved compared to households headed by males (aOR =0.81; 95% (CI) 0.66- 0.98). With regards to marriage, the odds of households with married household heads were 39 % lower of being dissolved compared with household heads who never married (aOR =0.61; 95% CI 0.50-0.75). Widowed, divorced and separated couples will not significantly associated with household dissolution.

Nuclear households were associated with 0.37 times the odds of being dissolved households compared to single member households (aOR =0.63; 95% (CI) 0.50- 0.78).

With regards to place of residency, rural households were associated with thrice as high the odds of being dissolved compared to urban households (aOR =2.55; 95% (CI) 0.87-1.42), and peri-urban households were associated with 0.18 times the odds of being dissolved compared to urban households (aOR =0.82; 95% (CI) 1.38-2.40).

The in-migration of 2 or more individuals into a household was associated with a 0.51 times the odds of being dissolved compared to households that experienced no in-migration at all (aOR =0.49; 95% (CI) 0.38-0.63). The out-migration of 2 or more individuals was associated with a 0.33 times the odds of household dissolution (aOR =0.67; 95% (CI) 0.53-0.84). Age and educational status of household head showed no significant associations but were added as priori.

**Table 3-6: Univariate and multivariate results of factors associated with household dissolution**

| Variable | Univariate | | Multivariate | |
|---|---|---|---|---|
| | OR 95% CI | P-Value | OR 95% CI | P-Value |
| **Education of household head** | | | | |
| Never been to school | Ref | | Ref | |
| Primary education | 0.96 (0.82-1.11) | <0.01 | 0.99 (0.82-1.21) | >0.05 |
| Secondary education | 1.21 (1.05-1.4) | | 1.20 (0.96-1.5) | |
| Tertiary education | 0.79 (0.61-1.04) | | 0.84 (0.57-1.23) | |
| **Change in employment** | | | | |
| No change | Ref | | Ref | |
| Positive change | 0.40 (0.34-0.46) | <0.01 | 0.51 (0.42-0.61) | <0.01 |
| Negative | 0.72 (0.6-0.87) | | 0.95 (0.75-1.2) | |
| Single Observations | 8.68 (7.35-10.26) | | 6.55 (2.08-20.62) | |
| **Change in grant status of household members** | | | | |
| No change | Ref | | Ref | |
| Positive change | 0.25 (0.22-0.29) | <0.01 | 0.31 (0.25-0.39) | <0.01 |
| Negative | 0.60 (0.53-0.69) | | 0.90 (0.74-1.09) | |
| Single Observations | 6.60 (5.58-7.79) | | 0.62 (0.2-1.95) | |
| **Change in wealth Index** | | | | |
| No change | Ref | | Ref | |
| Positive change | 0.45 (0.4-0.52) | <0.01 | 0.45 (0.38-0.54) | <0.01 |
| Negative | 1.2 (1-1.46) | | 0.95 (0.72-1.25) | |
| Single Observations | 2.51 (2.21-2.84) | | 0.99 (0.73-1.33) | |
| **Gender of deceased household members** | | | | |
| No household death | Ref | | Ref | <0.01 |
| Male | 1.28 (1.12-1.46) | <0.01 | 2.37 (1.92-2.92) | |
| Female | 0.97 (0.85-1.11) | | 1.68 (1.35-2.08) | |
| Both male and female | 0.86 (0.74-0.99) | | 2.07 (1.62-2.64) | |

| Variable | Univariate | | Multivariate | |
|---|---|---|---|---|
| | OR 95% CI | P-Value | OR 95% CI | P-Value |
| **Sex of household head** | | | | |
| Male | Ref | | Ref | |
| Female | 1.05 (0.95-1.17) | >0.05 | 0.81 (0.66-0.98) | ≤0.05 |
| **Marital status of household head** | | | | |
| Never married | Ref | | Ref | |
| Married | 0.46 (0.41-0.52) | <0.01 | 0.61 (0.5-0.75) | <0.01 |
| Separated/Widowed//divorced | 0.79 (0.69-0.9) | | 1.03 (0.8-1.31) | |
| **Household type** | | | | |
| Single member | Ref | | Ref | |
| Nuclear | 0.34 (0.3-0.39) | <0.01 | 0.63 (0.5-0.78) | <0.01 |
| Extended | 9.91 (0.72-1.15) | | 1.32 (0.9-1.93) | |
| **Residential Location** | | | | |
| Urban | Ref | | Ref | |
| Peri-urban | 1.13 (0.97-1.32) | >0.05 | 1.82 (1.38-2.40) | <0.01 |
| Rural | 1.04 (0.9-1.21) | | 2.55 (1.93-3.38) | |
| **Age of household head** | | | | |
| Under 20 years | Ref | | Ref | |
| 20-29 years | 1.05 (0.71-1.56) | <0.01 | 1.35 (0.72-2.54) | >0.05 |
| 30-39 years | 0.66 (0.45-0.98) | | 1.15 (0.62-2.15) | |
| 40-49 years | 0.53 (0.36-0.79) | | 1.26 (0.67-2.38) | |
| 50 years | 0.54 (0.36-0.8) | | 1.35 (0.70-2.58) | |
| 60+ | 0.71 (0.48-1.06) | | 1.45 (0.75-2.80) | |
| **Individual immigration** | | | | |
| No Immigration | Ref | | Ref | |
| 1 member | 1.1 (0.95-1.29) | <0.01 | 1.11 (0.87-1.42) | <0.01 |
| ≥2 | 0.3 (0.26-0.34) | | 0.49 (0.38-0.63) | |
| **Individual outmigration** | | | | |
| No outmigration | Ref | | Ref | |
| 1 member | 0.92 (0.8-1.05) | <0.01 | 1.21 (0.97-1.50) | <0.01 |
| ≥2 | 0.31 (0.27-0.35) | | 0.67 (0.53-0.84) | |
| **Religious status of household head** | | | | |
| None | Ref | | | |
| Christian | 0.82 (0.73-0.93) | ≤0.05 | | |
| Others | 0.91 (0.61-1.36) | | | |
| **Partnership status of household head** | | | | |
| No partnership | Ref | | | |
| In partnership | 0.86 (0.77-0.96) | ≤0.05 | | |

# 3 CHAPTER FOUR - DISCUSSION

Using data from the Africa Centre for Health and Population studies, the study examined the effect of household SES and other covariates on household formation and dissolution from 2003 to 2012 in a black rural South African population with a very high HIV prevalence. The chapter briefs the reader on the study findings and how these fit into previous work and the implications of the study. It ends with some conclusions and recommendations

Households in the average, rich and richest quintiles of the wealth index were more likely to be newly formed. Also, the higher the education level of the household head, particularly those with tertiary level of education, the higher the likelihood to form new households. Other factors similarly associated with household formation were female headed households, married household heads and smaller household size. But the fewer the number of employed household members and grant recipients in a household, the less likely they were to form new households. With regards to dissolution, a positive change in the household wealth index and employment, the less likelihood of dissolution. Also, female headed household, nuclear families, married household heads and the immigration into or outmigration out of households of 2 or more individuals were less likely to result in household dissolution. But deaths of household members, being resident in rural and periurban areas were more likely to result in household dissolution.

## 3.1 Household Socio-Demographic Factors and Formation

Household formation trends decreased over the study period. However, the yearly percentages of newly formed households in Figure 3.1 showed fluctuating patterns across study period with increased formation rates between 2003 - 2005 and again 2007 – 2009.The increased formation rates are consistent with findings of studies from elsewhere (Wittenberg and Collinson 2007a; Van Zyl, Cross, and Donovan 2008) that found an increase in household formation attributed to the splitting and/or increase in nuclear and single-person households. The high household

formation rates could probably be a result of access to houses through the national housing policy of which between the period of 2003-2008 a number of RDP houses were constructed in the study region to accommodate people living in overcrowded informal settlements (Tissington 2011). Within the period 2003 -2008, The 2006/2007 year recorded the highest number of houses. This corresponds to the peaks of household formation trends in figure 3 (38 290 versus 33668 completed houses /in process of completion in 2006/2007).

Klasen and Woolard (2009) have also shown that periods of high unemployment are associated with lower rates of household formation, as was found in this study. The declining formation rates is a result of decisions by individuals especially the youth choosing to stay with altruistic relatives and friends given the high unemployment rates as well as the increasing high cost of living (Card and Lemieux 1997; Kaplan 2012). Also, higher numbers of individuals migrating from rural to urban areas for greener pastures could results in the formation of households in urban settings could be the reason for the decreased formation of households in rural areas. Given that unemployed males are more likely to migrate to urban areas (Muhwava et al. 2010; Madhavan and Schatz 2007), it was no surprise that, this rural setting study shown that female headed households were more likely to be formed. Although these women are equally likely to be unemployed, their increased access to government grants may cushion them against the financial hardships assisting them in setting up new households (Bertrand, Miller, and Mullainathan 2000; Edmonds, Mammen, and Miller 2001; Van Zyl, Cross, and Donovan 2008). This has implications for improved quality of life of and stability of households. Previous studies from have shown how women especially older women play an important role in the care for unemployed and/or ill adults and orphaned children (Nyirenda et al. 2013; Nyirenda, McGrath, and Newell 2009; Hill, Hosegood, and Newell 2008; Hosegood and Timæus 2006).

With regards to marital status of the household head, a great majority of household heads were never married in newly formed household, but more than two-thirds were in partnerships. The low marriage rates are consistent with the declining level of marriages reported by the Statistics South Africa (2012).The study found that marriage is a significant determinant of household formation. The low marriage rates may partly be a result of increased cohabitation, extra marital affairs and increased divorce rates are characteristics of the second demographic transition. In addition, the decline in marriage rates is a reason why children may decide to co-reside with their parents (Umberson, Pudrovska, and Reczek 2010)Also, the low level of marriages especially in the household formation group could be attributed to majority of household heads of newly formed households being generally younger. The relatively high percentages of unmarried heads along with divorced and separated couples is a cause for concern in this study area characterised by high HIV prevalence (Zaidi et al. 2013) given that marriage may be protective against HIV acquisition (Stein et al. 2007), and the previously reported high HIV-related mortality in the area (Nyirenda et al. 2007).

Households were less likely to be formed in periurban than urban areas of the study area. This could be expected as the study area is characterised with high levels of rural-urban migration(Kok and Collinson 2006)

## 3.2 Household Socio-economic Factors and Formation

Tertiary education of household head was associated with a greater chance of household formation, that is, they are more likely to move out to form new households especially after marriage or finding employment.

It was, therefore, a rather surprising finding in this study that households with a higher number of employed persons were less likely to be newly formed. This may have been an effect of the

generally smaller numbers of individuals in newly formed households, hence were less likely to have a high number employed persons. The reason for the low formation rates although, an increase number of employed household members in pre-existing households may be due to the fact that, skilfully employed black South Africans increase from 15% in 1994 to 18% in 2014 compared to 42% to 61% among the white population(Statistics South Africa 2014b). Hence, majority of the black South African population attain low educational levels and engaged in low skill jobs and livelihoods such as sales persons, housemaids and cooks, gardeners etc. Although employed their wages are very low hence, they stay together to pool their resources (Maitra and Ray 2003; Moller and Radloff 2013). In addition, some individuals may as well stay in older households to support parents and relatives especially in South Africa setting where strong family ties exist (Taylor et al. 2015; Nyirenda et al. 2013).

Similar to household employment, the higher the numbers of grant recipients in a household the lesser the likelihood for these households to being newly formed. This is because grant recipients may be particularly altruistic and supportive to other family members as household members provide social and economic support to other household members. Keller (2004) found that pensioners supported younger household members against adverse labour market situations in rural South Africa. Similar to number of employed household members, logically, a greater household size has a greater chance of having grant recipients relative to smaller households. Also, different forms of government cash transfers exist in South Africa and the amount received varies according to the grant type. For example, child support grant is $30 compared to the old pension grants of $130 (Samson, Macquene, and Niekerk 2006). Hence, child support grant recipient members may not be financial dependent to form new households.

A majority of newly formed households were in the upper quintiles of the household wealth index (see Table 3.1). Wealthier households were more likely to be newly formed households as compared to the poorest households. When a greater number of employed and grant recipients individuals stay together in a household over time, these individuals may get wealthier as a consequence of their ability to save. They would then leave in the long term to start their own households, which would relatively start of as wealthy households.

## 3.3 Household Demographic Factors and Dissolution

Over the study period, dissolution trends have generally decreased. Household dissolution was the highest in 2006 followed by the gradual decline to 1.5% at the end of study period. The high dissolution rate in 2006 is a result of the high mortality rates as a result of the devastating effect of the HIV epidemic resulting in the death of household members especially of adults (Nyirenda et al. 2007; Hosegood et al. 2004; Sartorius et al. 2014). Multivariate results showed that households that recorded deaths were more likely to result in dissolution as compared to households that never experienced deaths at all. This is crucial for household stability in the study setting as HIV is highly prevalent. In the early 1990's, HIV associated mortality was very high until the initiation of ART's which resulted in longer survival rates. The impact of the ARTs in reducing mortality associated with HIV however, did not take immediate effect at the time of the implementation of ARTs (early 2000's) because of low coverage and acceptability by the HIV positive population (Bärnighausen, Bloom, and Humair 2007).

However, coverage increased over time and the long term implications is a healthy and productive population leading to an increase in household stability in the study population. This has implications for individual welfare of all household members especially children.

In contrary to household deaths, female headed households were less like to dissolve as compared with male household heads. This could be partly because they are more likely to have

access to grants and generally bear the heavier responsibility of care-giving within the family (Van Zyl, Cross, and Donovan 2008; Cinamon and Rich 2002). Hence, despite the financial challenges female headed households may be less likely to dissolve as compared male headed households. Similarly married household heads and nuclear families were less likely to result in household dissolution perhaps due to stronger familiar piety (Lowenstein 1999; Guthrie 2002; Knodel and Chayovan 2008). It was rather surprising that, widowed, separated and divorced category of household heads were not significantly associated with household dissolution. This can be attributed to the presence of state grants given to women mostly in the form of child support or pensions in the case of older women to mitigate against the effects of poverty. Also bigger households were less likely to dissolve compared to smaller households (ne member households) because bigger households are likely to have an increase in the number of employed, grant recipients and educated members. However, this greatly depends on the employment, educational, grant and asset status of individuals moving into households. Similarly, the outmigration of individuals from their respective households was less likely to result in household dissolution as Junming (1997) points out that, migration could be a response to opportunities especially for a better job, infrastructure and schools. The rationale behind this is that individuals especially the younger ones migrate out in times of adverse household conditions especially to urban centres to find opportunities to improve livelihood. They are then likely to send remittances home that help in boosting the socioeconomic conditions of households, thereby protecting households from dissolution.

As expected, rural and periurban households were more likely to dissolve as compared to urban households. This is expected because these households tend to be more deprived and the poorest. In addition, individuals with a comparable higher social class who live in rural households may

end up migrating for better living conditions thus leaving behind poor household members most especially the aged to their fate and hence these households are more likely to dissolve as compared to the urban households.

Similarly, the immigration of 2 or more members into a household within the period was less likely to result in household dissolution as these increases the size of the households and probably will positively improve the SES of household depending on the calibre of individual moving into the household.

## 3.4 Household SES Factors and Dissolution

As shown in Figure 3.5 close to a quarter of households had a positive change SES over the study period, be it grants, employment and household assets which could explain the declined rates of household dissolution in the study area. This is consistent to findings by Klasen and Woolard (2009) who found high rates of unemployment to be associated with household dissolution. A positive change in household employment, grant recipients and assets was less likely to result in the dissolution of a household as Hosegood (2004) had found. Similarly, Sartorius (2014) found an increment in household assets to be positively associated with household dissolution. Also households with pensioners were less likely to dissolve. This makes sense because wealthy households are more stable compared to poorer households .This is because, the young and economic active individuals of poorer households are prone to out-migrate and engage in transactional sex thereby acquiring HIV, a factor associated with decline in household SES dissolution.(Ogunmola, Oladosu, and Olamoyegun 2014).

The social contract theory fits into the household study in a number of ways. Since households are the basic units of society and important determinants of human welfare, individuals live together for a common good. They co-operate by sacrificing their personal freedom, rely on one

another for support and accept a leader who rules for the benefit of the all members of the household.

## 3.5 Conclusions

There is no doubt that the HIV epidemic has contributed to the economic drain of rural households. Factors associated with household formation and dissolution are similar to the drivers of the HIV epidemic. Hence programmes and policy interventions to mitigate against household dissolution and promote the formation of households would contribute to reducing the devastating impact of the HIV epidemic in the population. Using data from the Africa Centre for Health and Population Studies, we investigated SES effect on household formation. Similarly, we looked at a change in SES effect on the dissolution of households over the study period. Wealthier households as well as household heads with tertiary education were more likely to form households. On the other hand, households with greater employed and grant recipient members were less likely to be newly formed. Also, a positive change in SES variables (grant recipients, employed household members and the wealth index), together with nuclear families, married household heads and female headed households were less likely to result in dissolution. The study reaffirms the point that SES is an important determinant of household viability and plays an important role in the household processes, that is, promotes the formation of new households and prevents dissolution. Also, the study demonstrated that, government cash transfers are a valuable intervention that protects households from dissolving. These findings highlight the importance of socio-economic circumstances in household formation. The findings also show that, exploring different SES variables can unravel the rather complex relationship between socio-economic status and household dynamics. In this study more employed persons in the household did not necessarily lead to high rates of household formation, but that if the

household was relatively well-off its members were more likely to form new households. The relationship, however, between SES and household formation is more complex than the simple hypothesized case of higher SES will lead to higher household formation.

## 3.6 Recommendations

Although South Africa has progressed from apartheid to a welfare state through the implementation of antipoverty policies and programmes, the black rural South Africa population face challenges that need special attention. Poverty alleviation is a key tool to combat poverty in South Africa. This can be obtained through the development of effective poverty alleviation policies for implementation with the promotion of anti-corruption behaviours to ensure effective implementation to the targeted population. Much is therefore expected from the governments well as non-governmental organisations and stakeholders regarding ways to improve the SES conditions of poor households particularly prioritising female headed and rural households to bridge the gap between rich and poor households within the South African black population. Female empowerment should be encouraged and practised in the population. For example, increasing the amount of child support grants will improve the SES of female headed households. This will relieve household burden as women will support households economically. That is, giving them the opportunity to cater for themselves and children better.

The provision of educational packages through the provision of scholarships and bursaries to the rural needy students and informal education to rural uneducated adults will also enhance individual SES, household formation and welfare of rural poor households in the long term. The creation of jobs most especially good paying informal jobs opportunities to the black rural population and scale up on the coverage of grant beneficiaries to unemployed black needy individuals could also improve on household SES and stability. In line with this, wealth creation can be achieved through entrepreneurship and investment. The black population should be given

a special attention on skill acquisition and access to loans for businesses. Also, increasing the income (wages/salaries) of the working black population will improve their livelihoods and provide access to needs and services.

Marriage is a determinant of household formation. The encouragement of young individuals to marry and set up families is a way to reduce HIV related mortality and promote household formation. Also, the increased bride price, a characteristic of the study area in the midst of HIV is worry. There is the need for community leaders to dialogue to reduce the cost of bride prices among the Zulu population in order to increase marriage rates. This will not only increase the formation of households and decline dissolution in the area, but will improve couples health being and protect them from HIV provided the stay faithful to their spouses.

The Africa centre for demographic and population studies is situated in the study area, hence, high coverage of HIV prevention and management intervention programmes in the form of voluntary counselling and testing, condom use increased accessibility to ART's and above all combating stigma should be targeted in the population in order to reduce the infections and HIV related mortality in the area. Also, robust research targeting new knowledge in HIV management and treatment in the long term should be a priority to the South Africa government, health researchers and stakeholders.

Future studies on SES should also consider exploring the different SES variables on study outcomes because different SES variables are capable of exerting different results. Also, there is need for further indepth research (qualitative research) for nuanced understanding of the role of SES on household formation and dissolution in rural South Africa.

# 4 REFERENCES


Ayad, M., Piani AL., Barrère B., Ekouevi K., and Otto, J. 1994. "Demographic Characteristics of Households." In *Demographic and Health Survey Comparative Studies* 25-31. Calverton, Maryland: Macro International Inc.

Bärnighausen, Till, David E Bloom, and Salal Humair. 2007. 'Human resources for treating HIV/AIDS: needs, capacities, and gaps', *AIDS patient care and STDs*, 21: 799-812.

Beittel, M., J. Smith, and I. Wallerstein. 1992. *Creating and Transforming Households*.

Bertrand, Marianne, Douglas Miller, and Sendhil Mullainathan. 2000. "Public policy and extended families: evidence from South Africa." In.: National bureau of economic research.

Bowles, Roger, and Nuno Garoupa. 2002. 'Household dissolution, child care and divorce law', *International Review of Law and Economics*, 22: 495-510.

Card, David, and Thomas Lemieux. 1997. "Adapting to circumstances: The evolution of work, school, and living arrangements among North American youth." In. Cambridge, MA: National bureau of economic research.

Chandler, Joan, Malcolm Williams, Moira Maconachie, Tracey Collett, and Brian Dodgeon. 2004. 'Living alone: its place in household formation and change', *Sociological Research Online*, 9: www.socresoline.org.uk/9/3/chandler.html.

Cinamon, Rachel Gali, and Yisrael Rich. 2002. 'Gender differences in the importance of work and family roles: Implications for work–family conflict', *Sex Roles*, 47: 531-41.

Conger, R. D., K. J. Conger, and M. J. Martin. 2010. 'Socioeconomic Status, Family Processes, and Individual Development', *J Marriage Fam*, 72: 685-704.

Coovadia, Hoosen, Rachel Jewkes, Peter Barron, David Sanders, and Diane McIntyre. 2009. 'The health and health system of South Africa: historical roots of current public health challenges', *The Lancet*, 374: 817-34.

Cross, C, and TM Thembambhele. 1998. 'On the move: Poverty and the impact of migration in KwaZulu-Natal', *INDICATOR SOUTH AFRICA*, 15: 71-78.

Edmonds, Eric, Kristin Mammen, and Douglas Miller. 2001. "Rearranging the family? Household composition responses to large pension receipts." In *Dartmouth College, Department of Economics, Hanover, NH*.

Ermisch, John, and Pamela Di Salvo. 1997. 'The economic determinants of young people's household formation', *Economica*, 64: 627-44.

Fafchamps, Marcel, and Agnes R Quisumbing. 2007. 'Household formation and marriage markets in rural areas', *Handbook of development economics*, 4: 3187-247.

Fund, International Monetary. 2014. "World Economic Outlook (WEO) database." In *International Monetary Fund*. Washington DC: IMF.

Gregson, S., P. Mushati, and C. Nyamukapa. 2007. 'Adult mortality and erosion of household viability in AIDS-afflicted towns, estates, and villages in eastern Zimbabwe', *J Acquir Immune Defic Syndr*, 44: 188-95.

Guthrie, T. 2002. 'Family social security benefits in South Africa', *Social Dynamics-a Journal of the Centre for African Studies University of Cape Town*, 28: 122-45.

Haurin, Donald R, Patric H Hendershott, and Dongwook Kim. 1993. 'The impact of real rents and wages on household formation', *The Review of Economics and statistics*: 284-93.

Hill, Caterina , Victoria Hosegood, and Marie-Louise Newell. 2008. 'Children's care and living arrangements in a high HIV prevalence area in rural South Africa', *Vulnerable Children and Youth Studies*, 3: 65-77.

Hill, Laura. 2004. 'Connections between US female migration and family formation and dissolution', *Migraciones Internacionales*, 2: 60-82.

Hosegood, Victoria , Justus Benzler, and Geoff C. Solarsh. 2006. 'Population mobility and household dynamics in rural South Africa: implications for demographic and health research', *Southern African Journal of Demography*, 10: 43-67.

Hosegood, Victoria , and Ian M. Timæus. 2006. 'HIV/AIDS and older people in South Africa.' in Barney Cohen and Jane Menken (eds.), *Aging in sub-Saharan Africa: recommendations for furthering research* (The National Academic Press: Washinton, D.C.).

Hosegood, Victoria , and Ian. M. Timæus. 2005. 'Household Composition and Dynamics in KwaZulu Natal, South Africa: Mirroring Social Reality in Longitudinal Data Collection.' in Etienne van der Walle (ed.), *African Households. Census data* (M.E. Sharpe Inc.: New York).

Hosegood, Victoria, Justus Benzler, and Geoff C Solarsh. 2005. 'Population mobility and household dynamics in rural South Africa: implications for demographic and health research', *Southern African Journal of Demography*: 43-68.

Hosegood, Victoria, Nuala McGrath, Kobus Herbst, and Ian M Timæus. 2004. 'The impact of adult mortality on household dissolution and migration in rural South Africa', *J Acquir Immune Defic Syndr*, 18: 1585-90.

Hosegood, Victoria, Nuala McGrath, and Tom Moultrie. 2009. 'Dispensing with marriage: Marital and partnership trends in rural KwaZulu-Natal, South Africa 2000-2006', *Demographic Research*, 20: 279-312.

Jahn, Andreas, Amelia C Crampin, Judith R Glynn, Venance Mwinuka, Elenaus Mwaiyeghele, Johnbosco Mwafilaso, E Mwaiyeghele, V Mwinuka, and B Zaba. 2007. 'Evaluation of a village-informant driven demographic surveillance system in Karonga, Northern Malawi', *Demogr Res*, 16: 219-48.

Junming, Zhu. 1997. "Multilevel Analysis of Rural Outmigration in Guandong, China." In.: Citeseer.

Kahn, K., S. M. Tollman, M. A. Collinson, S. J. Clark, R. Twine, B. D. Clark, M. Shabangu, F. X. Gomez-Olive, O. Mokoena, and M. L. Garenne. 2007. 'Research into health, population and social transitions in rural South Africa: data and methods of the Agincourt Health and Demographic Surveillance System', *Scand J Public Health Suppl*, 69: 8-20.

Kaplan, Greg. 2012. 'Moving back home: Insurance against labor market risk', *Journal of Political Economy*, 120: 446-512.

Klasen, Stephan, and Ingrid Woolard. 2009. 'Surviving unemployment without state support: unemployment and household formation in South Africa', *Journal of African economies*, 18: 1-51.

Knodel, John, and Napaporn Chayovan. 2008. 'Intergenerational Relationships and Family Care and Support for Thai Elderly', *Ageing International*, 33: 15-27.

Kok, Pieter, and Mark Collinson. 2006. "Migration and urbanisation in South Africa." In. Statistics South Africa, Pretoria.

Lowenstein, A. 1999. 'Intergenerational family relations and social support', *Zeitschrift Fur Gerontologie Und Geriatrie*, 32: 398-406.

Madhavan, Sangeetha, and Enid J Schatz. 2007. 'Coping with change: Household structure and composition in rural South Africa, 1992—20031', *Scandinavian Journal of Public Health*, 35: 85-93.
Maitra, P., and R. Ray. 2003. 'The effect of transfers on household expenditure patterns and poverty in South Africa', *Journal of Development Economics*, 71: 23-49.
Marston, M., E. Slaymaker, I. Cremin, S. Floyd, N. McGrath, I. Kasamba, T. Lutalo, M. Nyirenda, A. Ndyanabo, Z. Mupambireyi, and B. Żaba. 2009. 'Trends in marriage and time spent single in sub-Saharan Africa: a comparative analysis of six population-based cohort studies and nine Demographic and Health Surveys', *Sexually Transmitted Infections*, 85: i64-i71.
May, Julian, and J Govender. 1998. 'Poverty and inequality in South Africa', *Indicator South Africa*, 15: 53-58.
Moller, Valerie, and Sarah Radloff. 2013. 'Perceptions of Fortune and Misfortune in Older South African Households: Social Assistance and the 'Good Life'', *Social Indicators Research*, 111: 633-64.
Muhwava, William , Victoria Hosegood, Makandwe Nyirenda, Kobus Herbst, and Marie-Louise Newell. 2010. 'Levels and determinants of Population Movements and Migration in rural KwaZulu Natal, South Africa', *African Population Studies*, 24: 260-80.
Muhwava, William, Victoria Hosegood, Makandwe Nyirenda, Kobus Herbst, and Marie-Louise Newell. 2013. 'Levels and determinants of migration in rural KwaZulu-Natal, South Africa', *African Population Studies*, 24: 259-80.
Nyirenda, M., M. Evandrou, P. Mutevedzi, V. Hosegood, J. Falkingham, and M.-L. Newell. 2013. 'Who cares? Implications of care-giving and -receiving by HIV-infected or -affected older people on functional disability and emotional wellbeing', *Ageing & Society*, FirstView: 1-34.
Nyirenda, M., V. Hosegood, T. Bärnighausen, and M. L. Newell. 2007. 'Mortality levels and trends by HIV serostatus in rural South Africa', *AIDS*, 21: S73-9.
Nyirenda, Makandwe , Nuala McGrath, and Marie-Louise Newell. 2009. "Death of the same-sex parent: the vulnerability of adolescents in rural South Africa to HIV infection." In *4th South African AIDS Conference*. Durban, South Africa.
Ogunmola, Olarinde Jeffrey, Yusuf Olatunji Oladosu, and Michael Adeyemi Olamoyegun. 2014. 'Relationship between socioeconomic status and HIV infection in a rural tertiary health center', *HIV/AIDS (Auckland, N.Z.)*, 6: 61-67.
Posel, Dorrit, Stephanie Rudwick, and Daniela Casale. 2011. 'Is marriage a dying institution in South Africa? Exploring changes in marriage in the context of ilobolo payments', *Agenda*, 25: 102-11.
Richter, Linda M, and Chris Desmond. 2008. 'Targeting AIDS orphans and child-headed households? A perspective from national surveys in South Africa, 1995–2005', *AIDS care*, 20: 1019-28.
Rosenzweig, Mark R, and Kenneth I Wolpin. 1994. 'Parental and public transfers to young women and their children', *The American Economic Review*, 84: 1195-212.
Rousseau, Jean-Jacques, S Dunn, and G. May. 2002. *The Social Contract: And, The First and Second Discourses* (Yale University Press: New Haven).
Samson, M, K. Macquene, and I.V. Niekerk. 2006. "Social Grants, South Africa." In *Policy Breif 1*, edited by E. Anderson. UK: Overseas Development Istitute.

Sartorius, Kurt, Benn K. D. Sartorius, Mark A. Collinson, and Stephen M. Tollman. 2014. 'The dynamics of household dissolution and change in socio-economic position: A survival model in a rural South Africa', *Development Southern Africa*, 31: 775-95.

Schneider, D. 2013. "Asset ownership and union formation in fragile families." In *Presented at the Population Association of America Annual Meetings*. New Orleans.

Solarsh, Geoff., Justus. Benzler, Victoria. Hosegood, Frank. Transer, and Vanneste Annemie. 2002. *Hlabisa DSS, Population and Health in Developing countries: Population Health and Survival at INDEPTH Sites* (International Development Research Centre: IDRC :Ottawa, Canada ).

Statistics South Africa. 2012a. "Census 2011: Metadata " In. Pretoria, South Africa: Statistics South Africa.

———. 2012b. "Marriage and Divorces." In. Pretoria: Statistics South Africa.

Statistics South Africa. 2013. "Quarterly Labour Force Survey :Quarter 4, 2013 " In. Pretoria, South Africa: Statistics South Africa

———. 2014a. "Quarterly Labour Force Survey (QLFS)." In. Pretoria, South Africa: Statistics South Africa.

———. 2014b. "Youth Employment, Unemployment, Skilled and Economic Growth, 1994 - 2014." In. Pretoria: Statistics South Africa.

Stein, JudithA, Adeline Nyamathi, JodieB Ullman, and PeterM Bentler. 2007. 'Impact of Marriage on HIV/AIDS Risk Behaviors Among Impoverished, At-Risk Couples: A Multilevel Latent Variable Approach', *AIDS and Behavior*, 11: 87-98.

Tamborini, Christopher R, Howard M Iams, and Gayle L Reznik. 2012. 'Women's earnings before and after marital dissolution: Evidence from longitudinal earnings records matched to survey data', *Journal of family and economic issues*, 33: 69-82.

Tanser, Frank, Victoria Hosegood, Till Bärnighausen, Kobus Herbst, Makandwe Nyirenda, William Muhwava, Colin Newell, Johannes Viljoen, Tinofa Mutevedzi, and Marie-Louise Newell. 2008. 'Cohort Profile: Africa centre demographic information system (ACDIS) and population-based HIV survey', *International Journal of Epidemiology*, 37: 956-62.

Taylor, K., C. Blacklock, G. Hayward, P. Bidwell, P. Laxmikanth, N. Riches, M. Willcox, S. Moosa, and D. Mant. 2015. "You can't stay away from your family': a qualitative study of the ongoing ties and future plans of South African health workers in the United Kingdom', *Glob Health Action*, 8: 26125.

Taylor, Paul, Kim Parker, Jeffrey S Passel D'Vera Cohn, Gretchen Livingstone, Wendy Wang, and Elleen Patten. 2011. 'Barely Half of US Adults Are Married–A Record Low', *Pew Research Center: Social & Demographic Trends.*, 27: 2013.

Tissington, K. 2011. "A Resource to Guide to Housing in South Africa 1994-2010." In.: SERI.

Umberson, Debra, Tetyana Pudrovska, and Corinne Reczek. 2010. 'Parenthood, Childlessness, and Well-Being: A Life Course Perspective', *Journal of marriage and the family*, 72: 612-29.

UNAIDS. 2013. "Global Report:UNAIDS report on the global AIDS epidemic 2013." In. WHO Library Cataloguing-in-Publication Data.

Urassa, Mark, J Ties Boerma, Raphael Isingo, Juliana Ngalula, Japheth Ng'weshemi, Gabriel Mwaluko, and Basia Zaba. 2001. 'The impact of HIV/AIDS on mortality and household mobility in rural Tanzania', *Aids*, 15: 2017-23.

Van Zyl, Johan, Catherine Cross, and M Donovan. 2008. "Overview of the extent and nature of the unbundling of South African households and the implications thereof." In *Paper Commissioned by The Presidency, South Africa*.

Welz, T., V. Hosegood, S. Jaffar, J. Batzing-Feigenbaum, K. Herbst, and M. L. Newell. 2007. 'Continued very high prevalence of HIV infection in rural KwaZulu-Natal, South Africa: a population-based longitudinal study', *J Acquir Immune Defic Syndr*, 21: 1467-72.

Wittenberg, M., and M. A. Collinson. 2007a. 'Household transitions in rural South Africa, 1996-2003', *Scandinavian Journal of Public Health*, 69: 130-37.

Wittenberg, Martin, and Mark Collinson. 2007b. "Restructuring of households in rural South Africa: Reflections on average household size in the Agincourt sub-district 1992-2003." In.: University of Cape Town and Agincourt Health and Population Unit, University of the Witwatersrand.

Wojcicki, Janet Maia. 2005. 'Socioeconomic status as a risk factor for HIV infection in women in East, Central and Southern Africa: a systematic review', *Journal of biosocial science*, 37: 1-36.

Zaidi, J., E. Grapsa, F. Tanser, M. L. Newell, and T. Bärnighausen. 2013. 'Dramatic increases in HIV prevalence after scale-up of antiretroviral treatment: a longitudinal population-based HIV surveillance study in rural Kwazulu-Natal', *AIDS*, 27: 2301-05.

Ziehl, Susan C. 2001. 'Documenting changing Family patterns in South Africa: A census Data of any Value', *African Sociological Review/Revue Africaine de Sociologie*, 5: 36-62.

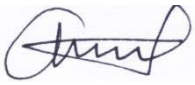
# 5 APPENDICES

## 5.1 Appendix I: Plagiarism Declaration

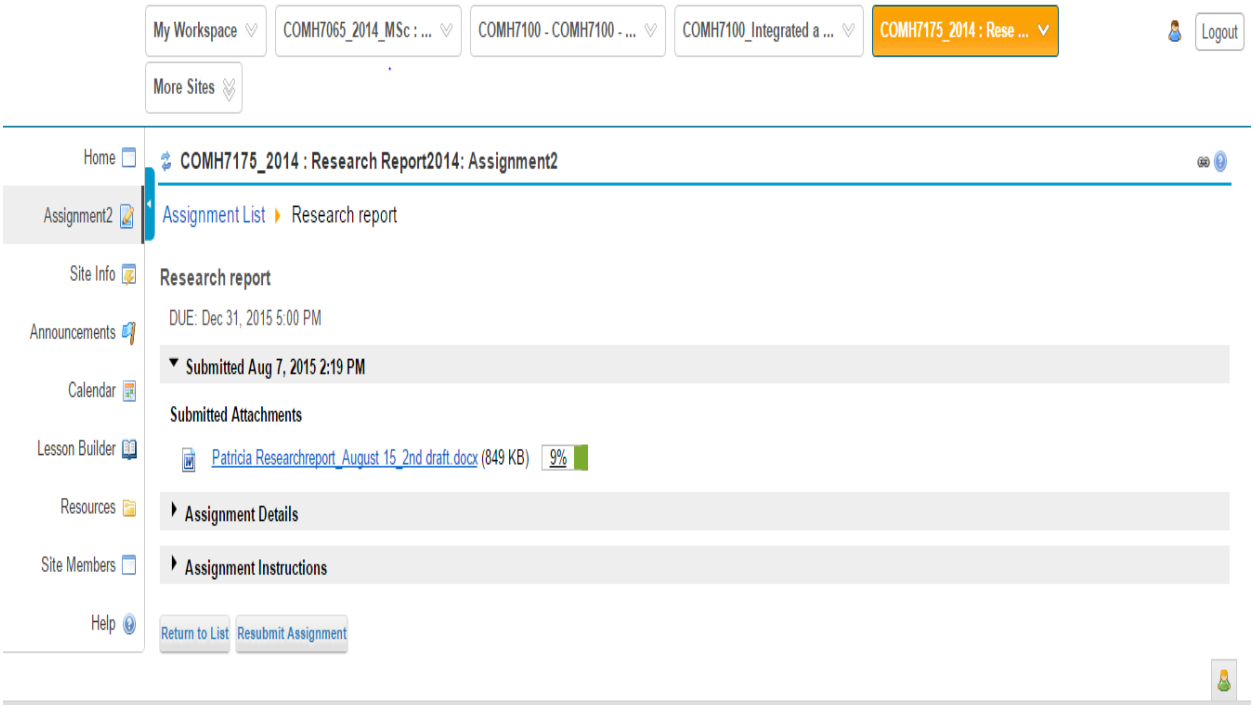

I Patricia Gweliwo (Student number: 706782) am a student registered for the degree of MSc Population Based Field Epidemiology in the academic year 2013.

I hereby declare the following:

- I am aware that plagiarism (the use of someone else's work without their permission and/or without acknowledging the original source) is wrong.
- I confirm that the work submitted for assessment for the above degree is my own unaided work except where I have explicitly indicated otherwise.
- I have followed the required conventions in referencing the thoughts and ideas of others.
- I understand that the University of the Witwatersrand may take disciplinary action against me if there is a belief that this is not my own unaided work or that I have failed to acknowledge the source of the ideas or words in my writing.

Signature:  Date: 7th August, 2015

## 5.2 Appendix II: Turnitin Plagiarism Report



## 5.3 Appendix III: Africa Centre for Health and Population Studies Ethics certificate

UNIVERSITY OF
KWAZULU-NATAL
INYUVESI
YAKWAZULU-NATALI
RESEARCH OFFICE
BIOMEDICAL RESEARCH ETHICS ADMINISTRATION
Westville Campus
Govan Mbeki Building
Private Bag X 54001
Durban
4000
KwaZulu-Natal, SOUTH AFRICA
Tel: 27 31 2604769 - Fax: 27 31 2604609
Email: BREC@ukzn.ac.za
Website: http://research.ukzn.ac.za/Research-Ethics/Biomedical-Research-Ethics.aspx

21 October 2013

Dr K Herbst
Africa Centre for Health & Population Studies
Nelson R Mandela School of Medicine
University of KwaZulu-Natal
kherbst@africacentre.ac.za

Dear Dr Herbst

**PROTOCOL: A socio-demographic platform for population-based reproductive health research in a rural health district of KwaZulu-Natal. Dr A J Herbst. Ref: E009/00**

**RECERTIFICATION APPLICATION APPROVAL NOTICE**

| | |
|---|---|
| Approved: | 20 November 2013 |
| Expiration of Ethical Approval: | 19 November 2014 |

I wish to advise you that your application for Recertification dated 21 August 2013 for the above protocol has been noted and approved by a sub-committee of the Biomedical Research Ethics Committee (BREC) for another approval period. The start and end dates of this period are indicated above.

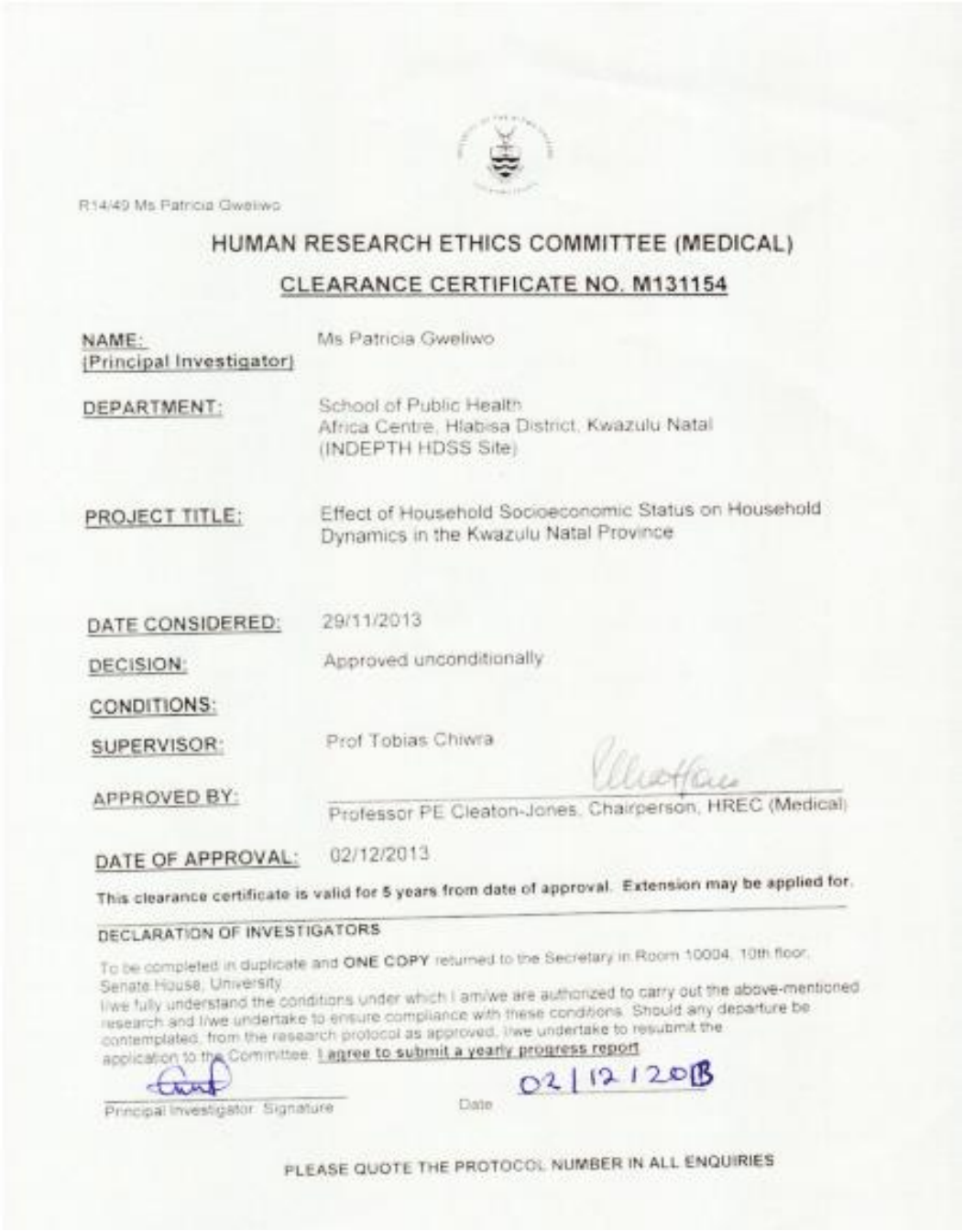
If any modifications or adverse events occur in the project before your next scheduled review, you must submit them to BREC for review. Except in emergency situations, no change to the protocol may be implemented until you have received written BREC approval for the change.

This approval will be ratified by a full Committee at its next meeting taking place on 12 November 2013.

Yours sincerely

Mrs A Marimuthu
Senior Administrator: Biomedical Research Ethics

## 5.4 Appendix IV: University of the Witwatersrand Ethics Certificate



R14/49 Ms Patricia Gweliwo

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

CLEARANCE CERTIFICATE NO. M131154

| | |
|---|---|
| NAME: (Principal Investigator) | Ms Patricia Gweliwo |
| DEPARTMENT: | School of Public Health<br>Africa Centre, Hlabisa District, Kwazulu Natal<br>(INDEPTH HDSS Site) |
| PROJECT TITLE: | Effect of Household Socioeconomic Status on Household Dynamics in the Kwazulu Natal Province |
| DATE CONSIDERED: | 29/11/2013 |
| DECISION: | Approved unconditionally |
| CONDITIONS: | |
| SUPERVISOR: | Prof Tobias Chiwra |
| APPROVED BY: | Professor PE Cleaton-Jones, Chairperson, HREC (Medical) |
| DATE OF APPROVAL: | 02/12/2013 |

This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and ONE COPY returned to the Secretary in Room 10004, 10th floor, Senate House, University.

I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated, from the research protocol as approved, I/we undertake to resubmit the application to the Committee. I agree to submit a yearly progress report

Principal Investigator Signature — Date: 02/12/2013

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES